Department of Public Works • Water & Wastewater Services
2555 West Copans Road • Pompano Beach, Florida 33369 • 954-831-0745

MINIMUM INSTALLATION AND TESTING REQUIREMENTS

Date: June 23, 2010
Date Last Issued: January, 2004
Date First Issued: Prior to 1990

This document approved by the Broward County Water & Wastewater Services Technical Standards Committee.

Steven W. Uhrick, P.E. Chair

Table of Contents

1 INSTALLATION OF NEW WATER MAINS

A. The installation of all new water mains shall be done in accordance with the requirements of AWWA Standard C600, "Recommended Standards for Water Works," the Department of Health, Water and Wastewater Services (WWS) Services, and the manufacturer's specifications and requirements.

B. See Installation Additional Requirements - Section 4.

C. Pipe Deflection - When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane or where long radius curves are permitted, the amount of deflection shall not exceed 75% maximum deflection recommended by manufacturer.

D. The minimum cover for ductile iron pipe is 30 inches.

2 INSTALLATION OF NEW WATER SERVICES

A. The installation of all new water services shall be done in accordance with the latest revision of AWWA Standard C600, C901 and C902 plus the additional requirements of the Department of Health, and WWS.

B. Laying

1. The bedding material used for service line installations shall consist of selected backfill material containing sand, no stone or rocks larger than 1" in diameter, and no drainfield lime rock larger than 3/4" in diameter.
2. When the service line is laid in the prepared trench, special care shall be taken to insure that minimum radius is maintained on plastic and copper service lines and that undue pressure is not exerted on the service line by rocks or other material protruding through the bedding material.
3. The interior of the service line shall be thoroughly cleaned of all foreign matter before being lowered into the trench. Compression joints and couplings shall be assembled in strict accordance with the manufacturer's recommendations. Particular care should be taken to keep foreign materials from interfering with proper joint assembly. The mating surfaces of the compression joint should be wiped clean. The tubing should then be inserted into the compression fitting and made tight according to the manufacturer's recommendations.
4. The maximum deflection of any service line shall not exceed 75% maximum deflection recommended by the tubing manufacturer. The service line shall terminate in an approved meter box or vault located within the public right-of-way or easement, adjacent to the property served.
5. See Installation Additional Requirements - Section 4.

3 INSTALLATION OF NEW GRAVITY SEWERS, FORCE MAINS AND PUMP/LIFT STATIONS

A. The installation of all new gravity sewers shall be done in accordance with the requirements of the "Recommended Standards for Waste Water Facilities (latest revision), DPEP, and WWS.

B. See Installation Additional Requirements - Section 4.

C. Pipe deflection is allowed for force mains only. See Section 1.

D. The minimum cover for ductile iron pipe is 30 inches. The minimum cover for PVC pipe is 36 inches.

4 INSTALLATION ADDITIONAL REQUIREMENTS

The installation of all new mains and services shall be in accordance with the requirements of WWS, and as stated herein.

A. Clearing

The Contractor shall perform all clearing necessary for the proper installation of all lines, and appurtenances in the locations shown on the drawings. Plantings, shrubbery, trees, utility poles or structures subject to damage resulting from the excavation shall be transplanted, relocated, braced, shored, or otherwise protected and preserved unless otherwise directed by the Engineer of Record.

B. Excavation

1. The Contractor shall perform all excavation of every description and of whatever substances encountered, to the dimensions and depth shown on the drawings or as directed. All excavations shall be made by open cut. All existing utilities such as pipes, poles, and structures shall be carefully supported and protected from injury, and in case of damage, they shall be restored at no cost to the County.
2. Work shall be properly sheeted and braced where necessary. Where wood sheeting or certain designs of steel sheeting are used, the sheeting shall be cut off at a level two feet above the top of the installed pipe and that portion below that level shall be left in place. If interlocking steel sheeting, of a design approved by the Engineer of Record is used, it may be removed providing removal can be accomplished without disturbing the bedding or alignment of the pipe. Any damage to the pipe bedding, pipe, or alignment of the constructed main caused by removal of sheeting shall be cause for rejection of the affected portion of the work.
3. Pipe trenches shall be excavated to a width, within the limits of the top of the

pipe and the trench bottom so as to provide a clearance on each side of the pipe barrel, measured to the face of the excavation, or sheeting if used, of not less than eight inches (8") nor more than twelve inches (12") except for pipe over eighteen (18") inches in nominal size, this maximum twelve (12") inches clearance may be increased to eighteen (18") inches. All pipe trenches shall be excavated to a level six inches (6") below the outside bottom of the proposed pipe barrel unless otherwise directed by the Engineer of Record. Properly sloped or shored per OSHA (Federal Register Part II, Department of Labor, OSHA 29CFR 1910; Permit required, confined spaces for General Industry, Final Rule) requirements and job site conditions, and Trench Safety Act (House Bill 3183 Law of Oct. 1, 1990)

4. Excavation for appurtenances shall be sufficient to provide a clearance between their outer surfaces and the face of the excavation, or sheeting if used, of not less than twelve inches (12"). Materials removed from the trenches shall be stored and disposed of in such a manner that they will not interfere unduly with traffic on public streets and sidewalks, and they shall not be placed on private property. In congested areas, such materials as cannot be stored adjacent to the trench or used immediately as backfill, if acceptable, shall be removed to convenient places of storage.

5. All excess material suitable for use as backfill shall be hauled to and used in areas where not enough suitable material is available from the excavation.

6. Suitable material in excess of backfill requirements and material unsuitable for backfill shall become the property of the Contractor and shall be removed from the work and disposed of by the Contractor at his expense.

7. All unsuitable material shall become the property of the Contractor and shall be removed from the work and disposed of by the Contractor at his expense.

8. Unsuitable material shall not be mixed with or allowed to contaminate suitable backfill material.

C. Dewatering

1. When practical, it is a requirement of these specifications that excavation shall be free from water before pipe or structures are installed. When not practical, work shall be done as specified by the Engineer of Record.

2. The Contractor shall provide all necessary pumps, under-drains, well point systems, and other means for removing water from trenches and other parts of the work. The Contractor shall continue dewatering operations until the backfill has progressed to a sufficient depth over the pipe to prevent flotation or movement of the pipe in the trench.

3. Water from the trenches and excavation shall be disposed of in such a manner as will not cause injury to public health, to public or private property, to the work completed or in progress, to the surface of the streets, or waterways or cause any interference with the use of the same by the public. When applicable, the Contractor shall use erosion control measures specified by permits.

D. Trench Stabilization

No claims for extras or additional payment will be considered for cost incurred in the

stabilization of trench bottoms which are rendered soft or unsuitable as a result of construction methods, such as improper or inadequate sheeting, dewatering or other causes. In no event shall pipe be installed when such conditions exist and the Contractor shall correct such conditions so as to provide proper bedding or foundations for the proposed installation.

E. Laying

1. A minimum two foot horizontal distance shall be maintained between new water main installations and any other utilities.

2. When the pipe is laid in the prepared trench, true to line and grade, the pipe barrel shall receive continuous, uniform support and no pressure will be exerted on the pipe joints from the trench bottom.

3. The interior of the pipes shall be thoroughly cleaned of all foreign matter before being lowered into the trench. During suspension of work for any reason at any time, a suitable stopper shall be placed in the end of the pipe last laid to prevent mud or other foreign material from entering the pipe. Lines shall be laid straight, and depth of cover shall be maintained uniform with respect to finish grade whether grading is completed or proposed at time of pipe installation. Where a grade or slope is shown on the drawings, batter boards with string line or a laser beam paralleling design grade shall be used by the Contractor to assure conformance to the required grade. No abrupt changes in direction or grade will be allowed. Any pipe found defective shall be immediately removed and replaced with sound pipe. Restrained joints shall be used for all bends, tees, plugs, and other fittings. The joints of all piping shall be made absolutely tight. The particular joint used shall be approved by the Engineer of Record and WWS prior to installation.

4. Mechanical joints shall be made up using annealed high strength cast iron bolts and rubber gaskets having either plain or duck tip as recommended by the manufacturer. All types of mechanical joint pipes shall be laid and jointed in full conformance with manufacturer's recommendations, which shall be submitted to the Engineer of Record for review and approval before work is begun. Torque wrenches set as specified in AWWA Standard C111 latest revision, shall be used; or spanner type wrenches may be used with the permission of WWS.

5. Push-on joints shall be made in strict, complete compliance with the manufacturer's recommendations. Lubricant, if required shall be an inert, nontoxic, water-soluble compound incapable of harboring, supporting, or culturing bacterial life. Manufacturer's recommendations shall be submitted to WWS for review and approval before work is begun.

F. Backfill

1. Backfilling of utility trenches will not be allowed until the work has been inspected by the Engineer of Record and he/she indicates that backfilling may proceed. Any work which is covered up or concealed without the knowledge and consent of the Engineer of Record may be required to be uncovered or exposed at no cost to the County.

2. Backfill material shall be non-cohesive and non-plastic, free of all debris,

lumps, clods, wood, broken paving or any organic or unstable material. Backfill material placed within one foot (1.0′) of the lines shall not contain any stones or rocks larger than two inches (2″) in diameter and no stones or rocks larger than six inches (6″) in diameter will be permitted in any backfill.

3. If a sufficient quantity of suitable backfill material is not available from the trench excavation, or other trench excavations within the site of the work, the Engineer of Record shall order the Contractor to provide additional material suitable for this purpose. The additional material shall be installed as specified herein.

4. Selected backfill material containing no stone or rocks larger than two inches (2″) shall be placed in six inch (6″) layers and thoroughly tamped to a depth of twelve inches over the top of the pipe. Particular attention and care shall be exercised in obtaining thorough support for the branch of all service connection fittings. Care shall be taken to preserve the alignment and gradient of the installed pipe.

5. After selected backfill has been placed to a depth of twelve inches (12″) over the pipe, backfilling shall proceed to a depth of thirty inches (30″) over the pipe by placing the backfill material in six inch (6″) layers and thoroughly compacting with mechanical vibrations. Backfill in this portion of the work shall be compacted to 100 percent of maximum density of the material as hereinafter defined.

6. After the backfill has been placed to a level thirty inches (30″) over the pipe, the remainder of the backfill shall be placed in layers, not to exceed nine inches (9″) and compacted with mechanical vibrators, or other suitable equipment, i.e., flooding to obtain a density of the backfilled material of not less than 100 percent of its maximum density as hereinafter defined.

7. An alternate method of backfilling shall be used when laying pipe underwater or when otherwise directed by the Engineer of Record. The alternate method of backfilling shall differ from the previously mentioned specification only in that the backfill material used around the pipe and to a level one foot (1.0) above the top of the pipe barrel shall be small diameter pea rock. Drain field lime rock not larger than 3/4″ in diameter is not acceptable.

8. Under certain circumstances flowable fill may be either desirable to use or is required by regulatory agencies. When used for backfilling purposes, the flowable fill shall meet the State of Florida, Department of Transportation specifications and requirements.

G. Restoring Surfaces

1. The top surfaces of the backfill shall be restored to the original or planned conditions or better. Trenches shall be carefully examined upon the completion of backfilling and surface irregularities that are dangerous or obstructive to traffic are to be removed. Paved sections shall conform in grade with adjacent areas and shall be of at least equal quality. Design mixes for flexible pavements shall be subject to approval by the local jurisdiction but shall adhere to Department of Transportation State of Florida rules and regulations and standards and/or other government agencies. All damaged or undermined areas of existing pavement, not previously removed, shall be removed and restored to original condition or in the

specified manner.

2. Equipment or traffic shall not travel over loose rock fragments, or other hard material, lying on sections of pavement which are not to be removed. For traffic control and safety barricades may be required. Removal, replacement and restoration of areas of pavement shall be as indicated on the drawings and the standard details.

3. Restoration shall conform with the requirements of the local jurisdiction.

5 PIPE BORING AND JACKING

A. The Contractor shall perform the pipe boring and jacking in accordance with the requirements specified herein.

B. Boring and Jacking materials and installation work shall be installed in accordance with standard practice and the requirements of the Florida Department of Transportation. The work shall be in accordance with and not limited to the following:

Contractor's Equipment: Shall be compatible with subsoil conditions encountered. The Engineer of Record may order the contractor to change his boring equipment if he considers it so non-compatible, and if, in his opinion, the change is necessary to safeguard the public and to protect public or private property.

Soil Stabilization: Unstable soil shall be stabilized ahead and around casing pipe by chemical grout injection and/or other acceptable methods.

Jacking: Installation of the casing pipe shall be a continuous operation until completed. It shall be done from one end of the crossing to the other without horizontal deflection or settlement of ground, surface facilities or structures.

Boring: Excavated materials shall be removed as jacking proceeds without causing voids behind casing pipe.

Grade Control: Casing lead pipe grade shall be checked at least every four feet or whenever directed. A jack shall be used at the head end to control grade as required.

Alignment Control: Alignment shall be controlled by guide rails set in the jacking pit.

Casing Pipe: Lengths shall be circumferentially welded in conformance with AWWA C206. After welding, the joint area inside and out shall be cleaned and the outside shall be given 2 coats of coal tar epoxy.

Carrier Pipe: The carrier pipe shall be jacked or cable-pulled with no tensile forces exerted on any pipeline joints.

6 TESTING WATER MAIN LINES

Water mains shall be tested in accordance with ANSI/AWWA Standard C600 latest

revision.

A. Hydrostatic Tests:

1. After a new water main has been laid and backfilled, it shall be pumped to a pressure of 150 PSI and all visible leaks stopped by approved methods. During the test, the pressure cannot drop more than 5 PSI below the starting pressure point.

2. A leakage test shall then be conducted at the above mentioned pressure and no installation will be acceptable by the Engineer of Record until the leakage is less than the number of gallons per hour as determined by the formula:

$$L = (S \times D \times P) \div 148000$$

in which L equals the allowable leakage in gallons per hour; S is the length of line in feet being tested; D is the nominal diameter of the pipe in inches; and P is the square root of the average test pressure during the leakage test in pounds per square inch. The test is usually maintained for two hours but it may be continued for one additional hour if it becomes apparent that the leakage is equal to or greater than the amount allowable. Water supplied to the main during the test to maintain the required pressure shall be measured by a 5/8-inch meter installed on the discharge side of the test pump, or by pumping from a calibrated container. A hose bib connection will be provided to accept the test gauge supplied by WWS.

3. The section of main being tested shall be limited to a maximum length of 2000'. When testing against closed metal-seated mainline valves, an additional leakage per closed valve of 0.0078 gal/hr/in. of nominal valve size shall be allowed. Any questions pertaining to procedures used during the test shall be decided WWS.

4. No allowable leakage shall be permitted for fire hydrants.

B. Bacteriological Tests:

1. After the water mains have satisfied the leakage requirements they shall be flushed through openings of the required size as detailed in ANSI/AWWA Standard C601 latest revision. The main shall then be sterilized in accordance with the provisions of the applicable sections of the above named specifications. On main breaks, cut-ins, etc., a liberal application of calcium hypochlorite shall be made; 50 PPM Chlorine during a 24 hour period.

2. Mains shall not be put into domestic service until the necessary bacteriological samples have been approved by the applicable regulatory agencies.

7 TESTING WATER SERVICE LINES

A. Hydrostatic Testing

Hydrostatic testing of water service lines shall be done in conjunction with the testing of the lateral or main line. No additional leakage allowance will be made for service lines or fire hydrants.

B. Sterilization

Sterilization of service lines shall be done in conjunction with the sterilization of the lateral or main line. Sufficient sampling points shall be taken from service line connections to assure uniform results throughout the system being tested.

8 TESTING FORCE MAIN LINES

Force mains shall be tested in accordance with AWWA Standard C600 latest revision.

A. Hydrostatic Tests:

1. After a new force main has been laid and backfilled, it shall be pumped to a pressure of 150 PSI and all visible leaks stopped by approved methods. During the test, the pressure cannot drop more than 5 PSI below the starting pressure point.
2. A leakage test shall then be conducted at the above mentioned pressure and no installation will be acceptable by the Engineer of Record until the leakage is less than the number of gallons per hour as determined by the formula:

$$L = (S \times D \times P) \div 148000$$

in which L equals the allowable leakage in gallons per hour; S is the length of line in feet being tested; D is the nominal diameter of the pipe in inches; and P is the square root of the average test pressure during the leakage test in pounds per square inch. The test is usually maintained for two hours but it may be continued for one additional hour if it becomes apparent that the leakage is equal to or greater than the amount allowable. Water supplied to the main during the test to maintain the required pressure shall be measured by a 5/8-inch meter installed on the discharge side of the test pump, or by pumping from a calibrated container. A hose bib connection will be provided to accept the test gauge supplied by WWS.

3. The section of main being tested shall be limited to a maximum length of 2000'. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gal/hr/in. of nominal valve size shall be allowed. Any questions pertaining to procedures used during the test shall be decided by WWS.

B. Cleaning and Flushing

Upon completion of the hydrostatic testing, all force main piping shall be flushed with a sufficient amount of clear water to displace test water. If the discharged water shows evidence of excessive mud, sand or other deposits, the Engineer of Record may direct the Contractor to continue flushing, or to clean the entire force main system by other approved methods to insure the removal of such deposits.

9 TESTING GRAVITY SEWER MAIN LINES

A. Infiltration, Exfiltration Gravity Sewer Main Line

1. The allowable limits of infiltration or exfiltration for the entire system, or any portion thereof, shall not exceed a rate of 100 gallons per inch of inside pipe diameter per mile of pipe per 24 hours. No additional allowance will be made for house service lines. The allowable limits of infiltration or exfiltration of manholes shall not exceed a rate of four gallons per manhole per 24 hours.
2. Any part or all of the system may be tested for infiltration or exfiltration, as directed by the Engineer of Record. Prior to testing for infiltration, the system shall be pumped out so that normal infiltration conditions exist at the time of testing. The amounts of infiltration or exfiltration shall be determined by pumping into or out of calibrated drums or by other methods approved by the Engineer of Record.
3. The exfiltration test will be conducted by filling the portion of the system being tested with water to a level equal to the lowest part of the manhole frame.
4. Tests shall be conducted on portions of the system not exceeding three manhole runs or maximum of 1200' (feet) whichever is greater unless otherwise directed by the Engineer of Record. Tests shall be run continuously for two hours.
5. Where infiltration or exfiltration exceed the allowable limits specified herein, the defective pipe, joints, or other fault construction shall be located and repaired by the Contractor. If the defective portions cannot be located, the Contractor shall remove and reconstruct as much of the work as is necessary in order to conform to the specified allowable limits.
6. The Contractor, at no expense to the County, shall provide all labor, equipment and materials and shall conduct all testing required, under the direction of the Engineer of Record.

B. Air Testing
1. Air testing is a method of testing the integrity of the pipeline and the structures that may be used in lieu of the method prescribed in paragraph A. (above). Also, WWS may direct the use of air testing under certain circumstances.
2. Testing procedures shall be in accordance with the following requirements. The results of the testing can be evaluated either by calculating the allowable times in accordance with charts or by using Pass/Fail charts that have been created by WWS.
3. At the start of the test, the pipelines are stabilized by pumping the lines with air to achieve a constant test pressure (for piping above the ground water table, it is necessary to achieve a constant 3.5 PSI; do not exceed 5 PSI). Maintain the test pressure for 5 minutes and do not permit the pressure to drop more than 0.5 PSI below the test pressure.
4. The test period begins when the pressure is adjusted to exactly 3.5 PSI (for piping above the water table) and the pressure supply is shut off. When the pressure bleeds to 3.0 PSI, start the test timing. Stop the time when the pressure bleeds to 2.5 PSI. Determine the time differential and compare it to the applicable charts (when calculating the allowable times).
5. If the bleed down time exceeds the allowable time per the chart, then the line passes. If the line reaches 2.5 PSI prior to reaching the allowable time, then it fails.
6. For piping that is below the water table, the above procedures are the same,

except that all pressures shall be adjusted (+) 0.433 psi/ft below the water table.

10 TESTING GRAVITY SEWER LATERAL

A. Infiltration/Exfiltration Gravity Sewer Laterals

1. Infiltration and exfiltration testing (Two feet of Head for exfiltration; zero head for infiltration) of service connection lines shall be done in conjunction with the testing of the lateral and/or main line sewer. No additional leakage allowance will be made for service lines.

2. Infiltration testing of service lines will not be permitted unless a minimum 2' (feet) static head of ground water exists over the shallow end of the service line at cleanout.

11 VISUAL INSPECTION GRAVITY SEWER MAIN LINES

On completion of each block or section of sewer, or such other times as the Engineer of Record may direct, the block or section of sewer is to be cleaned, tested and inspected. Each section of the sewer is to show, in examination from either end, a full circle of light between manholes. Each manhole or other appurtenance to the system shall be of the specified size and form, be water tight, neatly and substantially constructed, with the top set permanently to exact position and grade. All repairs shown necessary by the inspection are to be made; broken or cracked pipe replaced; all deposits removed and the sewers left true to line and grade entirely clean and ready for use.

12 WWS T.V. INSPECTION GRAVITY SEWER MAIN LINES

A. After all other testing has been successfully completed by the contractor; a television inspection of any or all lines may be made at WWS' discretion and expense. Any defective work or necessary corrections brought out during this inspection must be corrected by the Contractor, at his expense, before the lines can be accepted for maintenance by WWS. All mud, sand, debris and other deposits shall be removed by approved methods prior to inspection.

B. The WWS detailed procedure must be followed when televising new gravity sewers. Review and approval of the tapes must be done by NASSCO certified personnel.

C. The percent of standing water at a sag in a sewer main will determine if the pipe is acceptable or not.

1. Sags that make up 5% or less of the pipe area are approved.
2. Sags that are between 5-10% of the pipe area are at the discretion of the WWS to accept or reject.
3. Sags that are more than 10% of the pipe area are unacceptable and should be rejected unless justified by the Engineer of Record to WWS. Acceptance is not final until agreed to by WWS. A letter of credit or a performance bond will be required for sags such as this; warranty extensions without this protection are not acceptable.

13 TESTING BACKFILL

A. Compaction and Densities Testing

Methods of control and testing of backfill construction to be employed in this work are:

1. Maximum density of all backfill material shall be determined by ASSHTO Method Designation T-180-C.
2. Laboratory and field density tests, which, in the opinion of WWS are necessary to establish compliance with the compaction requirements of these specifications, shall be be made at such depths and locations as selected by WWS.
3. Trench backfill which does not comply with the specified densities, as indicated by such tests, shall be reworked and recompacted until the required compaction is secured, at no additional cost to the County.
4. The first test shall be 12″ above the top of pipe or the water table, and in 6″ lifts thereafter.

BROWARD COUNTY
FLORIDA
Public Works Department • Water & Wastewater Services
WATER & WASTEWATER ENGINEERING DIVISION
2555 West Copans Road • Pompano Beach, Florida 33369 • 954-831-0745 • FAX 954-831-0798/0925

PRODUCT SPECIFICATION SHEETS

Date: December 9. 2010
Date Last Issued: October 26, 2010
Date First Issued: June 23, 2010

This document approved by the Broward County Water & Wastewater Services Technical Standards Committee.

Steven W. Uhrick, P.E, Chair

These product specification sheets describe the minimum requirements established by Broward County's Water and Wastewater Services (WWS) for products used in WWS' potable water, reclaimed water and sanitary sewer distribution and collection systems. Products specific to treatment plants are not included.

Additionally, the product specification sheets list manufacturer's product models that are pre-approved by WWS to meet the described minimum requirements. However, products installed in WWS systems are not limited to those identified as pre-approved. The pre-approved list is ***not*** an exclusive collection of authorized products.

Products listed as pre-approved do not require the submittal of shop drawings for WWS Technical Standards Committee approval. Shop drawings for other products that meet the minimum requirements may be submitted for consideration. The submitted shop drawings must be approved by the Engineer of Record and the WWS Technical Standards Committee. Product categories not covered by the specification sheets require a submittal and WWS Technical Standards Committee approval of shop drawings.

Manufacturers are encouraged to submit their products' technical information to the WWS Technical Standards Committee for review. Upon conclusion of the review, the products may become listed as pre-approved.

These product specifications do not supersede any of the Broward County Purchasing Division's rules or regulations, the standard form construction documents, or the contract's technical specifications. Conflicts with any of the preceding documents should be submitted to WWS Engineering for resolution.

These product specifications are one part of WWS' "Minimum Design and Construction Standards" and are meant to work in conjunction with the other parts of the "Minimum Design and Construction Standards" and published standard details.

The following minimum requirements apply to all products:

- All products must be new and unused
- All products coming into contact with potable water must be ANSI/NSF 61 compliant
- Defective products shall always be cause for rejection

Chloramine resistance is a required material specification for system elements in contact with potable water. Some manufacturers provide a chloramine resistant material as the standard configuration of their product, while others offer chloramine resistant material as an option specified at the time of purchase. In the case where a chloramine resistant material is an optional product, the manufacturers have been identified with the symbol "*[CRTag]*" after their name/ product name on the product specification sheets. Products with the "*[CRTag]*" symbol must come with a factory applied tag indicating the material used and that the product supplied is chloramine resistant.

Table of Contents

5.3. Coupling and Adapters for Water Services
5.4. Curb Stop/ Meter Valve
5.5. Double Strap Service Saddles
5.6. Meter Flange for Water Services
5.7. Polyethylene Tubing for 1" and 2" Water Services
5.8. Type K Copper Tubing for 1" and 2" Water Services
5.9. U-Branch
5.10. Yokes

6. Meters

6.1. Compound Fireline Water Meter
6.2. Water Meter (4", 6", 8")
6.3. Fire Protection By-Pass Meter (1")
6.4. Service Meter (5/8", 1", 1 ½", 2")

7. System Structures, Boxes, and Covers

7.1. Box and Cover
7.2. Cleanout Box and Cover
7.3. Manhole
7.4. Manhole Risers
7.5. Manhole Connector
7.6. Manhole Grade Rings
7.7. Manhole Ring and Cover
7.8. Meter Box and Lid
7.9. Valve Box
7.10. Wetwell and Valve Pit Structures

8. Liners and Coatings

8.1. Coating for External Ductile Iron Pipe and Non-wet Concrete Surfaces
8.2. Manhole Chimney Seal
8.3. Wetwell, Valve Pit, & Manhole Coatings
8.4. Wetwell, Valve Pit, & Manhole Liners

9. Pumps

9.1. Submersible Wastewater Pumps (3-100 HP)

10. Product Specification Submittal Form

BROWARD COUNTY
FLORIDA

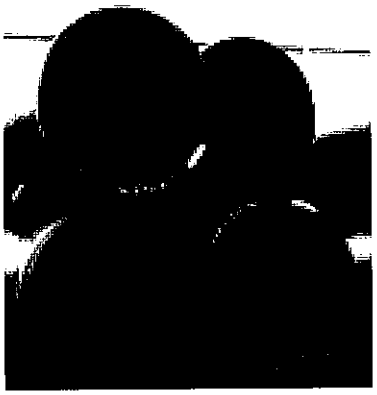
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

DUCTILE IRON PIPE & FITTINGS

Minimum Requirements:

- Meet or exceed AWWA/ANSI C151/A21.51, AWWA C150, AWWA/ANSI C111/A21.11, and AWWA/ANSI C110/A21.1, latest revisions.
- Material shall be ductile iron conforming to ASTM A536.
- Pressure classification for diameters 4" through 24" shall be 350.
- Pressure classification for diameters larger than 24" shall be determined by the Engineer of Record.
- Working pressure shall be 150 psi, minimum.
- Mechanical or push-on joints shall be the rubber gasket compression type.
- Pipe deflection shall not exceed 50% of the manufacturer's specified maximum amount.
- Sanitary sewer and reclaimed water mains shall have an interior coating of Protecto 401, 40 mils thick.
- Buried pipe and fittings shall have an exterior bituminous coating.
- Water main and fittings shall be cement lined and seal coated in accordance with AWWA/ANSI C104/A21.4, latest revision.
- All push-on fittings and joint restraints manufactured by the pipe manufacturer are approved for use on their respective pipes.



PRE-APPROVED MANUFACTURERS:

- ACIPCO
- US PIPE
- McWANE
- CLOW
- GRIFFIN PIPE

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 131, 153, 224, 322

Sheet Number	1.1

BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS
HIGH DENSITY POLYETHYLENE PIPE & FITTINGS (4" AND ABOVE)

Minimum Requirements:

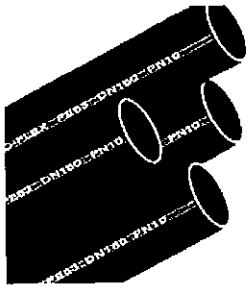
- Product use is acceptable only when installing pipe by directional drilling at the approval of BCWWS.
- Shall be DR 9 and meet or exceed AWWA C906, latest revision.
- Resin material shall meet or exceed the requirements of ASTM D3350, lasted revision.
- Material shall be high density polyethylene (HDPE), PE 4710, PE 3608, or PE 3408.
- Permanent identification of the piping shall be provided by equally spaced color stripes on the outside surface or by a solid colored pipe shell. The identifying colors are as follows:

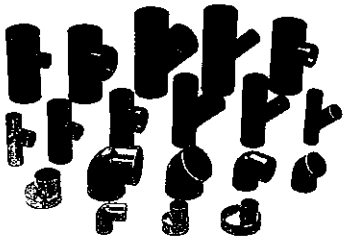
COLOR	SERVICE
Blue	Potable Water
Green	Wastewater or Forcemain
Purple	Reclaimed Water

- Size shall be chosen to maintain an internal diameter relatively equal to that of ductile iron pipe as indicated in the table below:

DIP SIZE	HDPE SIZE
4"	4"
6"	8"
8"	10"
10"	12"
12"	16"
14"	18"
16"	20"

- Pipe lengths and fittings shall be capable of being joined using fusion or mechanical joint methods according to ASTM F2620, D2657, and F1290, latest revisions.
- Shall be installed with two (2) tracer wires.





PRE-APPROVED MANUFACTURERS:

- ISCO (Ductile Iron Pipe Size)
- JM EAGLE (Ductile Iron Pipe Size)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

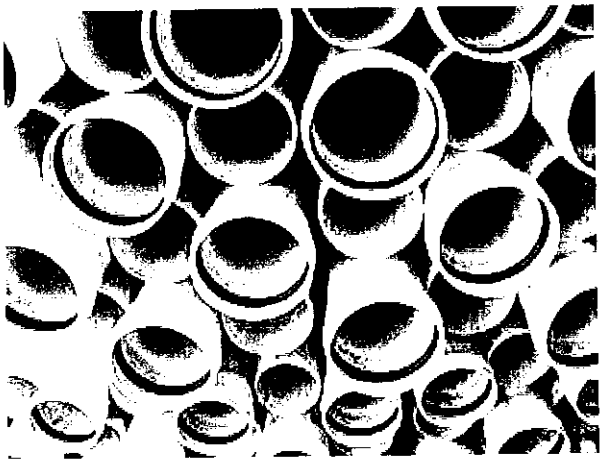
BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

PVC C900/C905 PRESSURE PIPE FOR GRAVITY SEWER AND RECLAIMED WATER

Minimum Requirements:

- Shall be DR 18 and meet or exceed AWWA C900 or C905, latest revision.
- Shall be used for gravity sewer installed at depths greater than 12 feet.
- Shall be new and not subjected to ultraviolet degradation.
- Pipe material shall be PVC C900 or C905.
- Working pressure shall be 150 psi, minimum.



PRE-APPROVED MANUFACTURERS:

- DIAMOND PLASTICS CORP.
- JM EAGLE
- CERTAIN TEED
- SANDERSON PIPES
- NORTH AMERICAN PIPE

Date: June 30, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	1.3

BROWARD COUNTY
FLORIDA

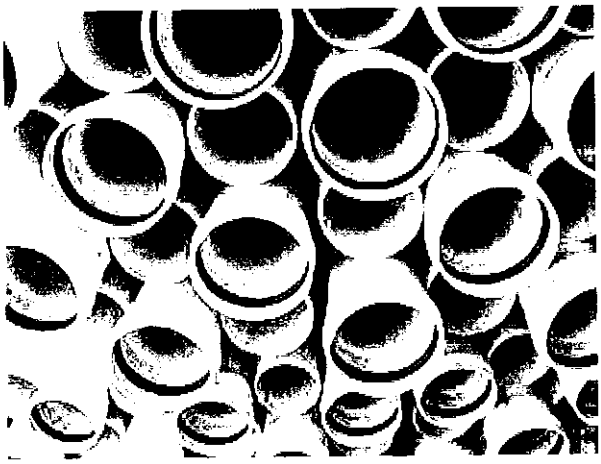
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

PVC SDR-26 NON-PRESSURE PIPE

Minimum Requirements:

- Shall be SDR-26 for pipe with less than or equal to 12' depth of cover.
- Shall be new and not subjected to ultraviolet degradation.
- Pipe material shall be made of compounds conforming to ASTM D1784 and manufactured in accordance with the material requirements of ASTM D3034.
- Joints shall be bell and spigot push-on rubber type gaskets meeting the requirements of ASTM D3212.
- Gaskets shall meet the requirements of ASTM F477.
- No solvent weld or threaded joints will be permitted.



PRE-APPROVED MANUFACTURERS:

- DIAMOND PLASTICS CORP.
- JM EAGLE
- SANDERSON PIPES
- NORTH AMERICAN PIPE

Date: June 30, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 313, 322, 331, 341

Sheet Number	1.4

BROWARD COUNTY
FLORIDA

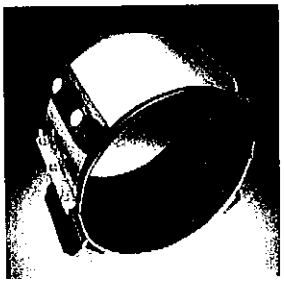
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

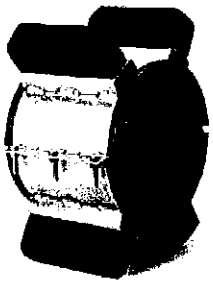
PRODUCT SPECIFICATIONS

CASING SPACERS FOR CARRIER PIPE 6" AND ABOVE

Minimum Requirements:

- Band, riser, and hardware material shall be stainless steel type 304.
- Liner material shall be PVC.
- Polymer runners shall be mechanically bolted to the riser.
- Riser shall be minimum 10 gauge and sized to support the pipe.
- Liner shall have a minimum thickness of 0.09".
- Band width shall be a minimum of 8".
- The band shall be a minimum 14 gauge.
- Runner coefficient of friction shall be per ASTM D1894.





PRE-APPROVED MANUFACTURERS:

- PSI (S8G-2, S12G-2)
- CASCADE WATERWORKS MFG. (CCS)
- ADVANCED PRODUCTS & SYSTEMS, INC. (SSI8, SSI12)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 153, 154, 155

Sheet Number	2.1

BROWARD COUNTY
FLORIDA

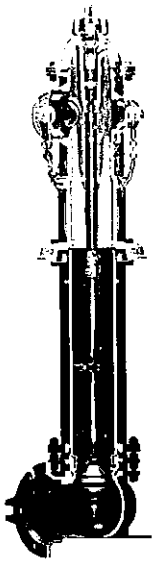
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

FIRE HYDRANT

Minimum Requirements:

- Fire hydrants shall meet or exceed AWWA C502, latest revision.
- Rated working pressure shall be 250 psi, test pressure shall be 500 psi.
- Hydrant bonnet assembly shall be provided with a grease or oil reservoir and lubrication system that automatically circulates lubricant to all operating stem threads and bearing surfaces each time the hydrant is operated. The system shall be completely sealed from the waterway and from external contaminants.
- The grease or oil used for lubrication shall be nontoxic and safe for use in potable water systems.
- All hydrants will be of the traffic "breakaway" type with safety stem coupling and breakable flange that permits full 360 degree rotation of the nozzle section. Cut down bolts are not acceptable for this requirement.
- The main valve opening of the hydrant shall not be less than 5-1/4".
- Hydrant nozzles will consist of two (2) 2-1/2" hose nozzles and one (1) 4-1/2" pumper nozzle. Threads on these nozzles will conform to N.F.P.A. # 1963 standard for screw threads and gaskets for fire hose couplings.
- All nozzles shall be field replaceable with noncorrosive locking devices.
- The hydrant shall be designed with an anti-friction bearing, located so that it reduces the torque required to operate the hydrant.
- The ferrous waterway of the hydrant's shoe must be epoxy coated.
- The main valve material shall be resistant to chloramines.
- Fire hydrant shall be painted yellow with a reflective type paint that is in accordance with NFPA #291 or per the latest requirements of the BC Fire Marshal or local fire department having jurisdiction.
- Reflective pavement markers in blue shall be used to identify the fire hydrant locations. Each marker is to be placed on the center line of the roadway lane closest to the hydrant.
- Inlet shall be six-inch (6") mechanical joint (MJ).



PRE-APPROVED MANUFACTURERS:

- MUELLER HIGH SECURITY SUPER CENTURION (250, A-423) *[CRTag]
- CLOW MEDALLION *[CRTag]
- AMERICAN DARLING (B-84-B) *[CRTag]
- AMERICAN AVK CLASSIC STYLE
- U.S. PIPE METROPOLITAN M-94 *[CRTag]

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 231

BROWARD COUNTY
FLORIDA

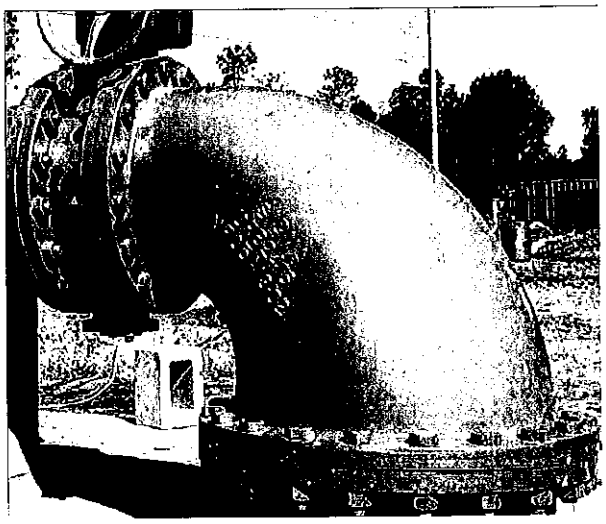
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

FLANGED FITTINGS

Minimum Requirements:

- Meet or exceed AWWA C153 or C110, latest revision.
- Joints shall conform to AWWA/ANSI C111/A21.11, latest revision.
- Bolt circle and bolt holes shall conform to ANSI B16.1, Class 125.
- Gasket shall be full flanged and the material shall chloramines resistant.
- Fitting body material shall be ductile iron conforming to ASTM 536.
- Bolt material shall be stainless steel 304.
- Pressure rating shall be 250 psi, minimum.
- Sanitary sewer and reclaimed water mains shall have an interior coating of Protecto 401, 40 mils thick.
- Water main shall be cement lined and seal coated in accordance with AWWA/ANSI C104/A21.4, latest revision.



PRE-APPROVED MANUFACTURERS:

- ACIPCO *[CRTag]
- US PIPE *[CRTag]
- STAR PIPE PRODUCTS *[CRTag]
- TYLER/UNION (Water main only) *[CRTag]
- SIGMA (Water main only) *[CRTag]

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	2.3

BROWARD COUNTY
FLORIDA

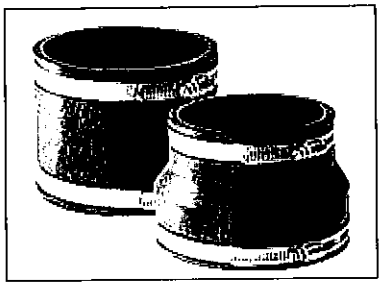
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

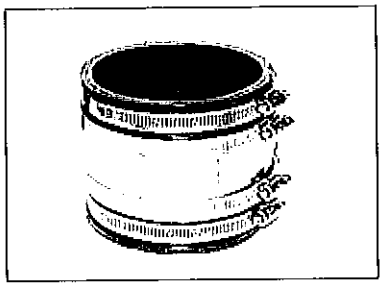
PRODUCT SPECIFICATIONS

FLEXIBLE COUPLINGS

Minimum Requirements:

- Sleeve material shall be PVC.
- Clamp and shear ring material shall be stainless steel.
- Shall connect to pipe of the same or different size and material.
- Shall provide a positive seal against infiltration and exfiltration.
- Bushings are not permitted.





PRE-APPROVED MANUFACTURERS:

- FERNCO (Standard, SS Shear Rings, Strong Back RC, 5000 Series Strong Back, No-Hub)
- MISSION

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	2.4

BROWARD COUNTY FLORIDA

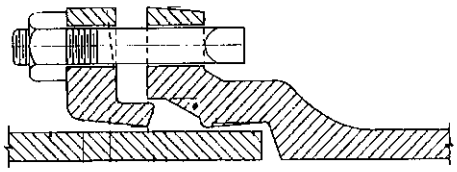
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

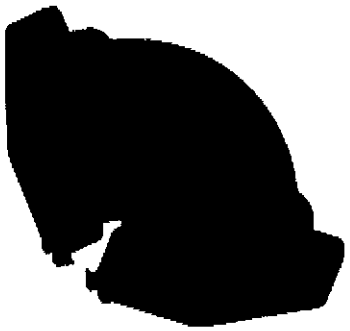
PRODUCT SPECIFICATIONS

MECHANICAL JOINT FITTINGS

Minimum Requirements:

- Meet or exceed AWWA/ANSI C153/A21.53 or C110/A21.1, latest revision.
- Shall be the rubber gasket compression type.
- Joints shall conform to AWWA/ANSI C111/A21.11, latest revision.
- Gasket material shall be chloramines resistant.
- Fitting body material shall be ductile iron conforming to ASTM 536.
- Pressure rating shall be 350 psi for 4" - 24" diameter fittings.
- Plain end fittings are not permitted.
- Sanitary sewer and reclaimed water mains shall have an interior coating of Protecto 401, 40 mils thick.
- Buried pipe and fittings shall have an exterior bituminous coating.
- Water main and fittings shall be cement lined and seal coated in accordance with AWWA/ANSI C104/A21.4, latest revision.





PRE-APPROVED MANUFACTURERS:

- ACIPCO (FASTITE) *[CRTag]
- US PIPE (TRIM TYTON, TYTON) *[CRTag]
- STAR PIPE PRODUCTS *[CRTag]
- TYLER/UNION (TYTON, Water main only)*[CRTag]
- SIGMA (TRIM TYTON, Water main only)*[CRTag]

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 109, 110, 111, 112

Sheet Number	2.5

BROWARD COUNTY
FLORIDA

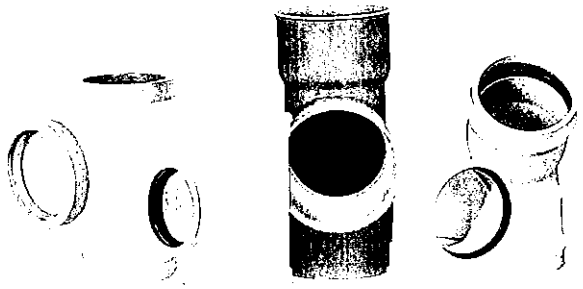
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

PVC SDR-26 FITTINGS FOR GRAVITY SEWER UP TO 12' IN DEPTH

Minimum Requirements:

- PVC fittings shall be SDR-26 when installed on pipes with less than or equal to 12' depth of cover.
- Shall conform to ASTM D3034, D3212, and F477, latest revisions.
- Shall be monolithic construction.
- Joints shall be spigot push-on rubber type gaskets meeting the requirements of ASTM D3212.
- Gaskets shall meet the requirements of ASTM F477.
- No solvent weld or threaded joints will be permitted.



PRE-APPROVED MANUFACTURERS:

- HARCO
- PLASTIC TRENDS
- MULTI-FITTINGS

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 313, 331, 341

Sheet Number	2.6

BROWARD COUNTY
FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

TAPPING SLEEVE

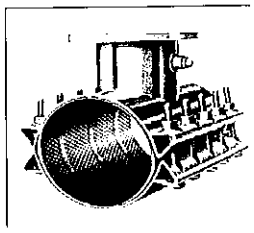
Minimum Requirements:

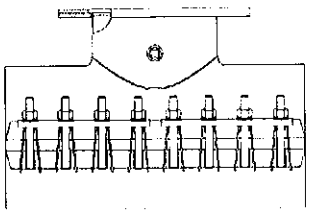
- Meet or exceed AWWA C223, latest revision.
- A test plug shall be provided on the outlet throat.
- Shall be recessed for a tapping valve.
- Recess dimensions shall comply with MSS- SP 60.
- Shall have a flat-faced flange.
- Minimum Tap Sizes for Water Mains

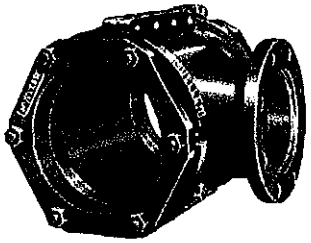
6" thru 16" : 6" Tap
18" thru 30" : 12" Tap
36" and larger : 20" Tap

- Size on size wet taps on asbestos cement pipe are not permitted.
- Body material shall be stainless steel or ductile iron.
- Gaskets on stainless steel models shall have restraints incorporated into the sleeve.
- Ductile iron models shall be the mechanical joint type with all end and side gaskets totally confined.

Stainless Steel







Ductile Iron

PRE-APPROVED MANUFACTURERS:

- **Ductile Iron**
  AMERICAN FLOW CONTROL (2800 Series)
  TYLER UNION
  MUELLER (H-615 Series)
  U.S. PIPE (Type-9)
- **Stainless Steel**
  JCM (432)
  FORD METER BOX (Style FTSS)
  SMITH BLAIR (663)
  MUELLER (H-304)
  ROMAC (Series SST)
  CASCADE (CST-EX)

*16" and larger requires shop drawing submittal to Engineer of Record and BCWWS.

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 131

Sheet Number	2.7

BROWARD COUNTY
FLORIDA

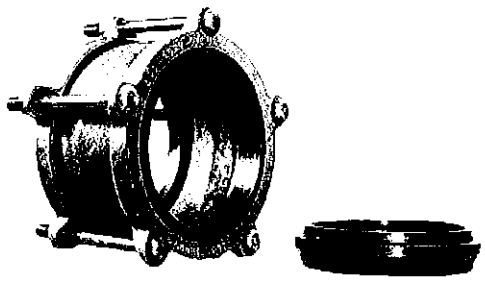
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

TRANSITION COUPLINGS

Minimum Requirements:

- Meet or exceed AWWA C-219, latest revision.
- Shall conform with ANSI/NSF 61.
- Working pressure shall be 150 psi, minimum.
- Sleeve body material shall be ductile iron conforming to ASTM A536 or stainless steel.
- Flange material shall be ductile iron conforming to ASTM A536.
- Hardware material shall be stainless steel.
- Gasket material shall be chloramines resistant.
- Shall be coated with a fusion epoxy.



PRE-APPROVED MANUFACTURERS:

- JCM INDUSTRIES (212) *[CRTag]
- SMITH BLAIR (441) *[CRTag]

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	2.8

BROWARD COUNTY
FLORIDA

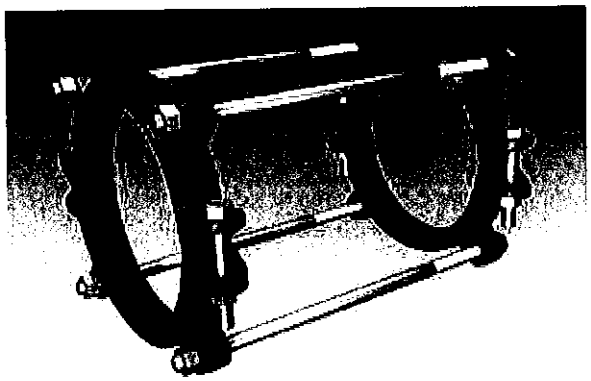
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

BELL JOINT RESTRAINT FOR DUCTILE IRON AND PVC PIPE

Minimum Requirements:

- Compatible with joints which meet AWWA C111, latest revision.
- Restraining rings material shall be ductile iron conforming to ASTM 536.
- Restraining rod material shall be 304 stainless steel.
- Working pressure shall be 250 psi, minimum, for ductile iron pipe.
- Shall be rated to the full working pressure of PVC pipe.
- The restraint device shall consist of split restraint rings with serrations on the inside diameter.



PRE-APPROVED MANUFACTURERS:

Ductile Iron Pipe

- SIGMA (PV LOK)
- EBAA IRON (1700 MEGALUG HARNESS)

PVC Pipe

- FORD METER BOX (UNI-FLANGE SERIES 1390)
- EBAA IRON (SERIES 1600PV, SERIES 1500PV)
- SIGMA (PV LOK)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	3.1

BROWARD COUNTY
FLORIDA

Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

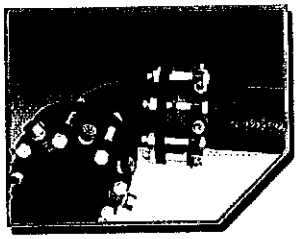
PRODUCT SPECIFICATIONS

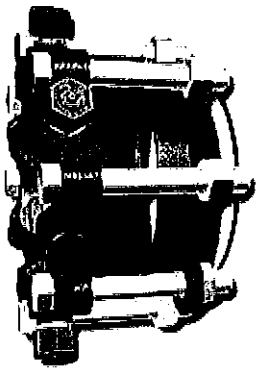
DUCTILE IRON FLANGE ADAPTERS

Minimum Requirements:

- Flange bolt circles meet or exceed AWWA/ANSI C110/A21.10.
- Body material shall be ductile iron conforming to ASTM A536.
- Sealing gasket material shall be chloramines resistant.
- Shall utilize gripping wedges to maximize restraint capabilities.
- Torque limiting actuating screws shall be used to ensure proper initial setting of the gripping wedges.
- Shall be capable of deflection up to 5 degrees.
- Shall allow a minimum 0.6 inch gap between the end of the pipe and the mating flange without effecting the integrity of the seal.
- Minimum pressure rating, categorized by pipe material, shall be as follows:

  Ductile iron 20" and under: 200 psi
  PVC C-900 DR18 20" and under: 150 psi





PRE-APPROVED MANUFACTURERS:

- EBAA IRON (Series 2100)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	3.2

BROWARD COUNTY
FLORIDA

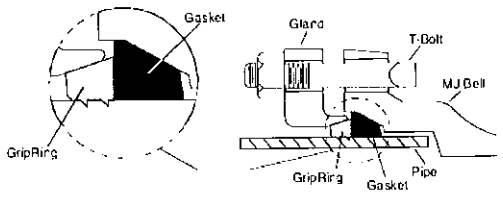
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

GRIPPING RING MECHANICAL JOINT RESTRAINT FOR DUCTILE IRON AND PVC PIPE

Minimum Requirements:

- Compatible with joints which meet AWWA C111, latest revision.
- The gripping ring type mechanical joint restraint shall be acceptable on pipe diameters 4" through 12".
- Meet or exceed ASTM F1674 for use on PVC pipe.
- Wedge gasket material shall be chloramines resistant.
- Gland body and gripping ring material shall be ductile iron conforming to ASTM 536.
- T-bolts and nuts shall conform to AWWA C111, latest revision.
- Working pressure shall be 250 psi, minimum, for ductile iron pipe.
- Shall be rated to the full working pressure of PVC pipe.
- Pipe deflection shall not exceed 50% of the manufacturer's specified maximum amount.
- Restraint device shall consist of a gripping ring held in place by the follower gland.



PRE-APPROVED MANUFACTURERS:

Ductile Iron

- ROMAC (GRIP RING) *[CRTag]
- ACIPC Fast Grip Gaskets *[CRTag]

PVC Pipe

- ROMAC (GRIP RING) *[CRTag]

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	3.3

BROWARD COUNTY
FLORIDA

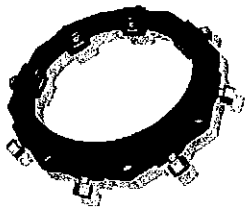
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

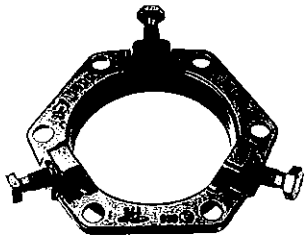
PRODUCT SPECIFICATIONS

MECHANICAL JOINT RESTRAINT FOR DUCTILE IRON AND PVC PIPE

Minimum Requirements:

- Compatible with joints which meet AWWA C111, latest revision.
- The follower gland and gripping wedge style joint restraint shall be acceptable on pipe diameters 4" and above.
- Meet or exceed ASTM F1674 for use on PVC.
- Body material shall be ductile iron conforming to ASTM 536.
- Wedge gasket material shall be chloramines resistant.
- Gripping wedge and actuating component material shall be ductile iron conforming to ASTM 536.
- Working pressure shall be 250 psi, minimum, for use on ductile iron pipe.
- Shall be rated to the full working pressure of the PVC pipe.
- Restraint devices shall consist of multiple gripping wedges incorporated into the follower gland.
- Mechanism shall be in place to ensure proper tightening of the restraint without overstressing the pipe. Properly tightening the restraint shall not depend upon accurate field measurements of applied pressure or utilize a tool which requires calibration. Torque-off bolts are an example of an acceptable tightening mechanism.





PRE-APPROVED MANUFACTURERS:

Ductile Iron Pipe

- EBAA IRON (MEGALUG SERIES 1100) *[CRTag]
- ROMAC (ROMA GRIP) *[CRTag]
- FORD METER BOX (UNI-FLANGE SERIES 1400) *[CRTag]
- STAR PIPE PRODUCTS (STARGRIP SERIES 3000) *[CRTag]
- SIGMA (One-Lok SLD) *[CRTag]

PVC Pipe

- FORD METER BOX (UNI-FLANGE SERIES 1500) *[CRTag]
- EBAA IRON (MEGALUG SERIES 2000 PV) *[CRTag]
- STAR PIPE PRODUCTS (STARGRIP SERIES 4000) *[CRTag]
- SIGMA (ONE-LOK SLC) *[CRTag]

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 109, 110, 111, 112

Sheet Number	3.4

BROWARD COUNTY
FLORIDA

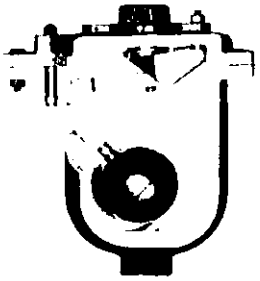
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

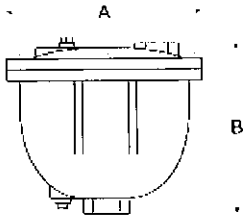
PRODUCT SPECIFICATIONS

AIR RELEASE VALVES FOR POTABLE WATER AND RECLAIMED WATER

Minimum Requirements:

- Meet or exceed AWWA C512, latest revision.
- Body, cover, and baffle material shall be cast iron or ductile iron conforming to ASTM A126 or A536.
- Float and trim material shall be stainless steel.
- Resilient seat material shall be chloramines resistant.
- Air release shall automatically release small pockets of air from the pipeline while in operation and under pressure.
- Shall have a minimum 3/32" orifice for a minimum working pressure of 150 psi.
- Valve inlet and outlet shall be threaded.
- Combination Air/Vacuum Valves are not acceptable.
- Except where otherwise specified, interior ferrous surfaces, exclusive of stainless steel surfaces, of all valves shall be coated with two-part thermosetting epoxy coating or fusion bonded epoxy coating. Flange faces of valves shall not be epoxy coated.
- Exterior surfaces shall be coated with a primer.
- The epoxy shall be suitable for use in potable and reclaimed water.





PRE-APPROVED MANUFACTURERS:

- GOLDEN-ANDERSON (#920, #922) *[CRTag]
- CRISPIN (PL10, PL10A, PL20, PL20A) *[CRTag]

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 127

Sheet Number	4.1

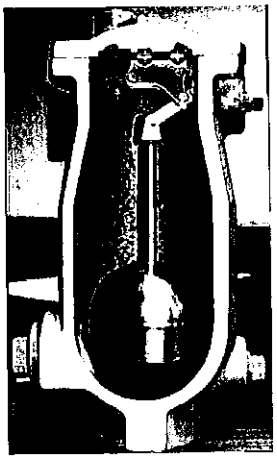
BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

AIR RELEASE VALVES FOR WASTEWATER

Minimum Requirements:

- Meet or exceed AWWA C512, latest revision.
- Combination Air Valves are acceptable when required based upon calculations by the Engineer of Record. Specific brand and model will be determined by the Technical Standards Committee.
- Air Release Valve shall be of the type that automatically releases air, gas, or vapor under pressure during system operation.
- Body and cover material shall be cast or ductile iron conforming to ASTM A126 or ASTM A536, or stainless steel.
- Trim, float, and seat material shall be stainless steel.
- Orifice button material shall be synthetic rubber.
- The inlet, outlet, and venting orifice shall be sized by the Engineer of Record.
- The outlet shall be threaded.
- Working pressure shall be 150 psi, minimum.
- Except where otherwise specified, interior ferrous surfaces, exclusive of stainless steel surfaces, of all valves shall be coated with two-part thermosetting epoxy coating or fusion bonded epoxy coating. Flange faces of valves shall not be epoxy coated.
- Exterior surfaces shall be coated with a primer.
- The epoxy shall be suitable for use in wastewater.



PRE-APPROVED MANUFACTURERS:

- GOLDEN ANDERSON (#929)
- CRISPIN (S Series)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 127

Sheet Number	4.2

BROWARD COUNTY
FLORIDA

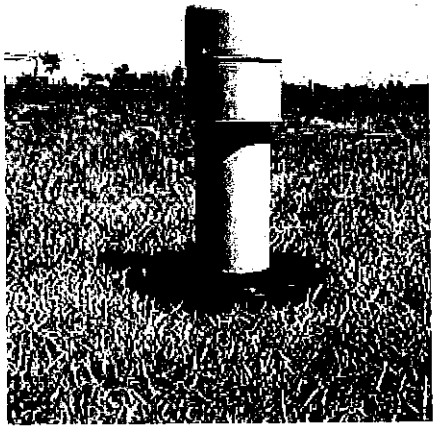
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

AUTOMATIC BLOWOFF

Minimum Requirements:

- Shall be a self-contained unit powered by a 9V battery with a 1 year minimum operational life.
- Material for the above-grade components shall be designed for direct exposure to the sun.
- Internal piping material shall be SDR 80 PVC.
- Mounting brackets and hardware material shall be stainless steel.
- Internal piping and control valve shall have a minimum operational rating of 200 psi.
- Internal piping and control valve shall be removed from the housing by means of a quick-disconnect.
- Male 2" NPT water supply connection.
- Discharged water shall be directed downward.
- Sampling system shall be designed to reduce potential for contamination.
- Shall have a minimum of four (4) programmable flushing cycles.
- Shall have manual on/off functions with a locking dome cover.



PRE-APPROVED MANUFACTURERS:

- HYDRO-GUARD STANDARD UNIT
- KUPFERLE FOUNDRY CO. (9400 WC ECLIPSE)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 253, 254

Sheet Number	4.3

BROWARD COUNTY
FLORIDA

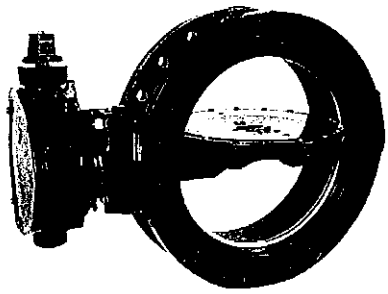
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

BUTTERFLY VALVES (12" AND LARGER)

Minimum Requirements:

- Meet or exceed AWWA C-504, Class 150B, latest revision.
- Body and disc material shall be cast or ductile iron conforming to ASTM A126 or A536.
- Seat and all rubber material shall be chloramines resistant.
- Shaft, nuts, screws, and hardware material shall be stainless steel.
- Valve disc shall be rigidly attached to the shaft to eliminate any relative motion.
- Shaft shall be offset from the disc and body seats so that they do not intersect.
- Shafts of 3" diameter and smaller shall be one piece through the valve with factory set thruster(s) to center the disc in the seat.
- Shafts larger than 3" diameter shall be stub-shafts rigidly keyed to the disc.
- Stub-shafts shall be provided with an adjustable thruster(s) to move the disc and shaft assembly positively in either direction to center the disc in the seat.
- Valves shall open left, or counterclockwise.
- Buried service valves shall have a 2" operating nut.
- Valve operators for valves 24" and smaller shall be traveling nut or worm gear type; Valves larger than 24" shall be equipped with worm gear type operators.
- Operators shall be one size larger than the minimum specified by the manufacturer.
- Except where otherwise specified, interior and exterior ferrous surfaces, exclusive of stainless steel surfaces, in all valves shall be coated with two-part thermosetting epoxy coating or fusion bonded epoxy coating. Flange faces of valves shall not be epoxy coated.
- The epoxy shall be suitable for use in potable water, reclaimed water, and wastewater.



PRE-APPROVED MANUFACTURERS:

- MUELLER (LINESEAL III) *[CRTag]
- VAL-MATIC *[CRTag]
- MILLIKEN *[CRTag]
- PRATT (#2MII,#2FII,TRITON-XR70) *[CRTag]

Date: December 9, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	4.4

BROWARD COUNTY
FLORIDA

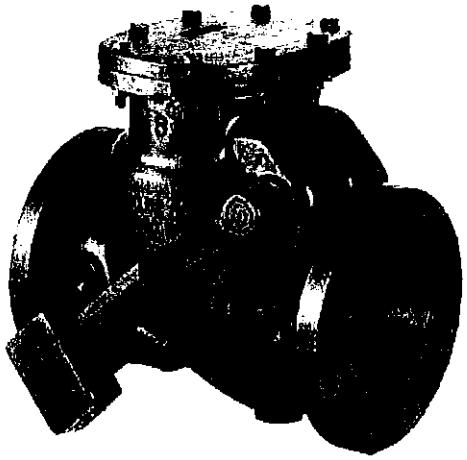
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

CHECK VALVES FOR LIFT STATIONS

Minimum Requirements:

- Meet or exceed AWWA C508 , latest revision.
- Shall be the flapper type with a lever and weight and capable of handling sewage fluids under pressure.
- Seating material shall be bronze to metal.
- Material for all internal working parts shall be stainless steel.
- Shall have O-ring packing.
- Shall have flanged ends.
- When the lift station is discharged to a pressurized system the valve shall be equipped with an air piston to minimize slamming.
- Side plugs are not permitted.
- Except where otherwise specified, ferrous surfaces, exclusive of stainless steel surfaces, of all valves four (4)-inch and larger, as well as the exterior surfaces of all submerged valves, shall be coated with two-part thermosetting epoxy coating or fusion bonded epoxy coating. Flange faces of valves shall not be epoxy coated.
- The epoxy shall be suitable for use in reclaimed water and wastewater.



PRE-APPROVED MANUFACTURERS:

- M&H (159-02)
- MUELLER (2600-6-01)
- AMERICAN FLOW CONTROL (SERIES 50-SC)
- GOLDEN ANDERSON (FIGURE 220)
- CLOW (5380)

Date: June 30, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: Standard Lift Station Details

Sheet Number	4.5

BROWARD COUNTY
FLORIDA

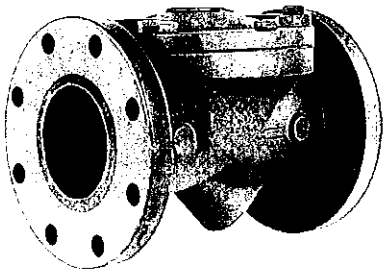
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

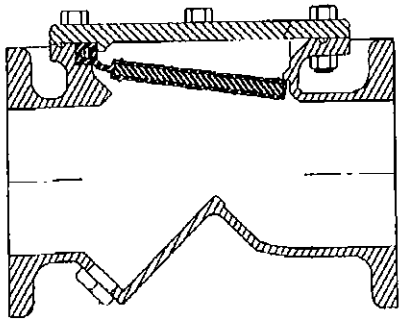
PRODUCT SPECIFICATIONS

CHECK VALVES FOR POTABLE WATER

Minimum Requirements:

- Meet or exceed AWWA C508, latest revision.
- Shall be the flexible, rubber coated disc type.
- Body material shall be cast or ductile iron conforming to ASTM A126 or ASTM A536.
- Seating shall be rubber to metal.
- Rubber material shall be chloramines resistant.
- Bolts and nuts shall be stainless steel.
- Working pressure shall be 250 psi or greater.
- Side plugs shall not be permitted.
- Valves shall have a resilient hinge. Valves designed with a shaft and mechanical hinge are not permitted.
- Except where otherwise specified, interior and exterior ferrous surfaces, exclusive of stainless steel surfaces, in all valves four (4)-inch and larger shall be coated with two-part thermosetting epoxy coating or fusion bonded epoxy coating.
- The epoxy shall be suitable for use in reclaimed water and wastewater.





PRE-APPROVED MANUFACTURERS:

- MUELLER (FLEXIBLE DISK) *[CRTag]
- DANFOSS FLO-FLEX (745) *[CRTag]
- AFC SERIES 2100 (FLANGED BY FLANGED)
- AFC 2100 HYDRANT SECURITY CHECK VALVE (MJ BY SOLID GLAND)

Date: September 27, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 231, 235, 236

BROWARD COUNTY
FLORIDA

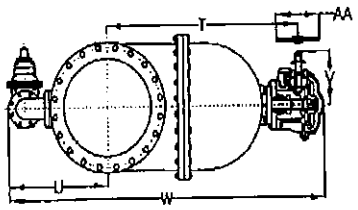
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

DOUBLE DISC GATE AND TAPPING VALVE (12" - 48")

Minimum Requirements:

- Meet or exceed AWWA C-500 latest revisions.
- Tapping valves shall have one flanged end conforming to ANSI standards.
- Shall have clear waterway equal to the full nominal diameter of the valve.
- Body material shall be cast or ductile iron conforming to ASTM A126 or A536.
- Valve seat material shall be bronze.
- Stuffing box and operating nut material shall be cast or ductile iron conforming to ASTM A126 or A536.
- Valve stem material shall be bronze conforming to ASTM B62 or stainless steel for valves 42" and greater.
- Nuts and bolts material shall be 304 stainless steel.
- Valves are to be iron body, bronze mounted, double disc, non-rising stem, parallel seat type, opening left (counter-clockwise).
- The operating mechanism shall be for buried service with a 2" square operating nut.
- Valves shall have a minimum of 2 points of bearing in the wedging mechanism.
- Valves 16" and larger shall be furnished with bevel gears and by-pass valves. Bevel geared valves shall have roller, tracks, and scrapers.
- Valves 12" in size shall have a minimum working pressure of 200 psi and be tested at 400 psi; Valves 14" and larger shall have a minimum working pressure of 150 psi and be tested at 300 psi.
- Except where otherwise specified, interior and exterior ferrous surfaces, exclusive of stainless steel surfaces, in all valves shall be coated with two-part thermosetting epoxy coating or fusion bonded epoxy coating. Flange faces of valves shall not be epoxy coated.
- The epoxy shall be suitable for use in potable water, reclaimed water, and wastewater.



Flanged ends, NRS, with Bevel Gears, By-Pass

PRE-APPROVED MANUFACTURERS:

- MUELLER (A-2380, H-667) *[CRTag]
- KENNEDY VALVE *[CRTag]
- CLOW VALVE *[CRTag]
- M&H VALVE *[CRTag]

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 131

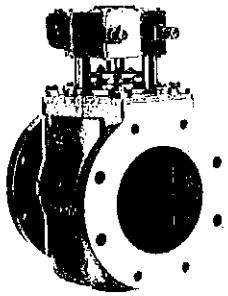
BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

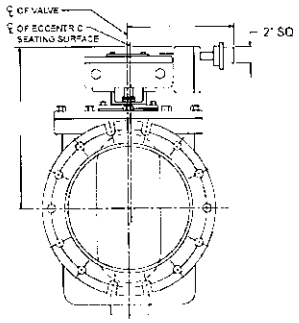
PRODUCT SPECIFICATIONS

ECCENTRIC PLUG VALVES

Minimum Requirements:

- Meet or exceed AWWA C517, latest revision.
- Valve and actuator shall be capable of operation in either direction of flow.
- Valve shall be bubble tight in both directions.
- Shall be designed for buried service.
- Buried service valves shall have mechanical joint ends.
- Lift Station valves shall have flange ends.
- Body material shall be cast or ductile iron conforming to ASTM A126 or ASTM A536.
- Body seat material shall be welded nickel alloy or type 316 stainless steel.
- Material for the bearings shall be permanently lubricated 316 stainless steel , bronze, or Teflon.
- Material for the nuts, bolts, springs, and washers shall be 316 stainless steel.
- Pressure rating shall be 175 psi, minimum, for valves up to 12" diameter.
- Pressure rating shall be 150 psi, minimum, for valves 14" diameter and above.
- Shall be operated by a two (2) inch operating nut.
- Port area of valves shall be 100% of the full pipe area.
- Stainless steel plate seats must be locked in the body cavity and replaceable through the bonnet access.
- Bearing areas shall be isolated from the flow.
- Shall have packing bonnets where the shaft protrudes from the valve.
- Packing shall be the self-adjusting type and replaceable without removing the bonnet.
- Valves 10" and greater shall have worm gear operators.
- Operators shall be sized one size greater than the manufacturer's suggested minimum.
- Except where otherwise specified, interior and exterior ferrous surfaces, exclusive of stainless steel surfaces, of all valves four (4)-inch and larger shall be coated with two-part thermosetting epoxy coating or fusion bonded epoxy coating. Flange faces of valves shall not be epoxy coated.
- The epoxy shall be suitable for use in potable and reclaimed water, and wastewater.





PRE-APPROVED MANUFACTURERS:

- DEZURIK (PEF)
- MILLIKEN VALVE CO. (Series 600/601)
- HENRY PRATT

*16" and greater requires shop drawing submittal to the Engineer of Record and BCWWS.

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 418

Sheet Number	4.8

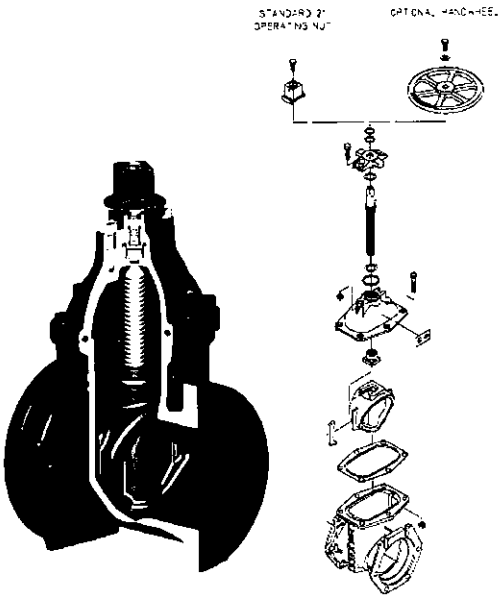
BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

GATE AND TAPPING VALVE (10" AND UNDER)

Minimum Requirements:

- Resilient seat or wedge (RW) line valves shall meet or exceed AWWA C509 or AWWA C515, latest revisions.
- Valves shall meet or exceed AWWA C550.
- Shall be the resilient seat type, with a non-rising stem, opening left (counterclockwise).
- No leakage will be allowed or permitted.
- Body material shall be cast or ductile iron conforming to ASTM A126 or A536.
- Wedge material shall be cast or ductile iron, fully encapsulated with a chloramines resistant material.
- Stuffing box and operating nut material shall be cast or ductile iron conforming to ASTM A126 or A536.
- Gate valve stem material shall be bronze conforming to ASTM B 62 or stainless steel.
- Hex head nuts and bolts material shall be 304 or 316 stainless steel.
- Valve disc shall be contoured to assure uniform seating.
- Both ends shall be mechanical joint in accordance with ANSI/ AWWA A21.11/C111.
- Pressure rating shall be 250 psi, minimum.
- Shall have a two-inch (2") square operating nut.
- Resilient seat and other rubber tight parts shall be formed of synthetic elastomer which is corrosion and chloramines resistant.
- Except where otherwise specified, interior and exterior ferrous surfaces, exclusive of stainless steel surfaces, in all valves four (4)-inch and larger shall be coated with two-part thermosetting epoxy coating or fusion bonded epoxy coating. Flange faces of valves shall not be epoxy coated.
- The epoxy shall be suitable for use in potable water and reclaimed water.



PRE-APPROVED MANUFACTURERS:

- AMERICAN FLOW CONTROL (2500 SERIES)
- AMERICAN AVK
- CLOW (2639) *[CRTag]
- KENNEDY VALVE *[CRTag]
- MUELLER (A2360,T2360) *see note

MUELLER A2360 and T2360 product tag must end with 0331 which indicates chloramines resistance

Date: August 6, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 123

Sheet Number	4.9

BROWARD COUNTY
FLORIDA

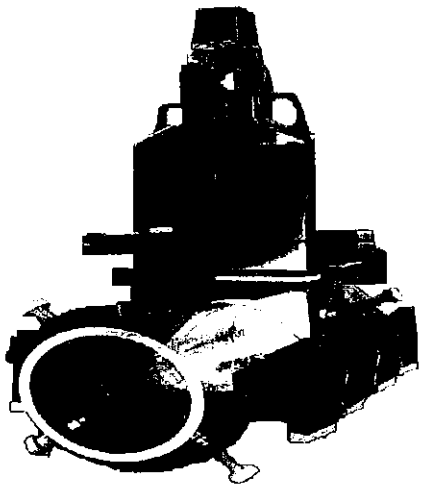
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

INSERTION VALVE

Minimum Requirements:

- This product specification is under development. Until then, shop drawing submittals are required.



PRE-APPROVED MANUFACTURERS:

Date: XXXXX
Date Last Issued: XXXXX
Date First Issued: XXXXX
Standard Detail: XXXXX

Sheet Number	4.10

BROWARD COUNTY
FLORIDA

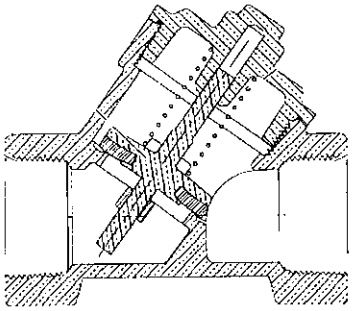
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

CHECK VALVES FOR WATER SERVICES

Minimum Requirements:

- Meet or exceed AWWA C800, latest revision, for all brass components.
- Body material shall be brass conforming to ASTM B62.
- Spring material shall be stainless steel.
- O-Rings shall be made from chloramines resistant material.
- Shall be a single spring and poppet assembly.
- Removable access cap shall allow for inspection and replacement of internal working parts without removing the check valve from the service line.
- Working pressure shall be 150 psi, minimum.
- Maximum head loss shall be as follows:
  1" valve: not to exceed 4 psi at 20 gpm.
  2" valve: not to exceed 1 psi at 50 gpm.
- Shall have a female iron pipe inlet and outlet.



PRE-APPROVED MANUFACTURERS:

- FORD METER BOX (HS11-444 [1"], HS11-777 [2"])

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 221, 222, 224, 226, 227, 228

Sheet Number	5.1

BROWARD COUNTY
FLORIDA

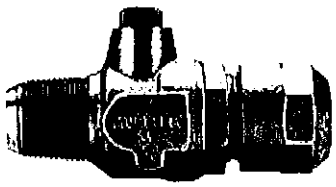
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

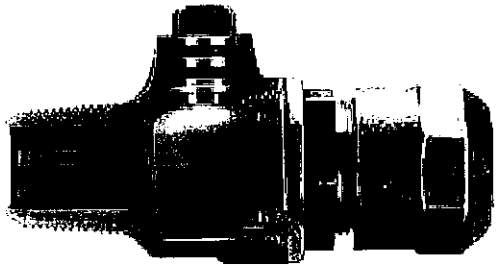
PRODUCT SPECIFICATIONS

CORPORATION STOP

Minimum Requirements:

- Meet or exceed AWWA C800, latest revision.
- Body material shall be brass alloy in accordance with ASTM B62.
- Shall be ball valve type.
- Inlet shall be male threaded to match the saddle.
- Outlet connections shall have a compression type fitting for water service lines. All other connections shall be per the design.
- All rubber gasket seals shall be chloramines resistant.





PRE-APPROVED MANUFACTURERS:

- FORD METER BOX (FB-1000)
- MUELLER (B-25008) *[CRTag]
- CAMBRIDGE BRASS (301) *[CRTag]
- A.Y. McDONALD MFG. CO. (4701B-22)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 205, 206, 221, 222, 224, 235, 236, 237

BROWARD COUNTY
FLORIDA

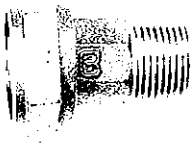
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

COUPLING AND ADAPTERS FOR WATER SERVICES

Minimum Requirements:

- Meets or exceeds AWWA C800, latest revision.
- Working pressure shall be 150 psi, minimum.



PRE-APPROVED MANUFACTURERS:

- CAMBRIDGE BRASS (105, 117, 119, 417)
- MUELLER
- FORD METER BOX
- A.Y. McDONALD (4761-22, 4753-22, 4754-22, 4758-22, 4620)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 226, 227, 228

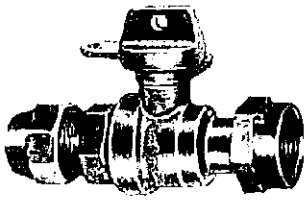
BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

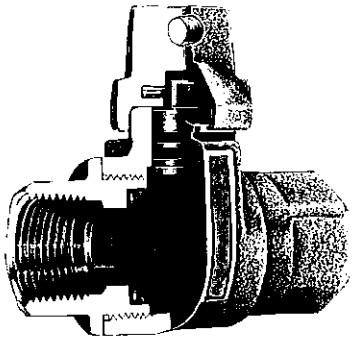
PRODUCT SPECIFICATIONS

CURB STOP/ METER VALVE

Minimum Requirements:

- Meet or exceed AWWA C800, latest revision.
- Body material shall be brass conforming to ASTM B62.
- Shall be the ball valve type with full port opening.
- Ball and seat material shall be fluorocarbon coated with a chloramines resistant seat material or nickel and chrome platted brass with a fluorocarbon seat.
- Shall have a tee-head with a locking wing.
- Shall be water tight against flow in either direction.
- Seal around the stem shall consist of two (2) o-rings.
- O-Ring material shall be chloramines resistant.
- Valve shall open and close with a 90^{O} turn of a standard slotted wrench.
- Shall have a working pressure of 300 psi.
- Shall have a pack-joint compression fitting on the inlet.
- Meter valves for 1 1/2" and 2" meters shall have flanged connections on the outlet sides. Meter valves over 2" will be considered on an individual basis for the particular installation involved.





PRE-APPROVED MANUFACTURERS:

- FORD METER BOX STRAIGHT BALL VALVES (B41-444, B41-777)
- FORD METER BOX BALL METER VALVES (B43-444W, B43-344W, BF43-777W)
- MUELLER 300 BALL CURB VALVES (P25122) *[CRTag]
- MUELLER 300 BALL STRAIGHT METER VALVES (P24335, P24350) *[CRTag]
- CAMBRIDGE BRASS (210, 212, 292) *[CRTag]
- A.Y. McDONALD MFG. CO. (4602B-22, 74602B-22, 6101MW, 76101MW, 6100MW-22, 76100MW-22)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 226, 227, 228

Sheet Number	5.4

BROWARD COUNTY
FLORIDA

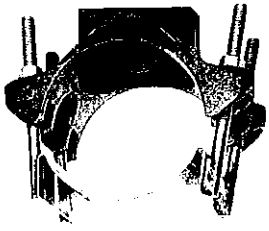
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

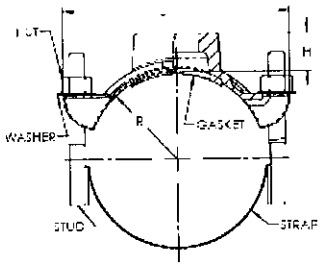
PRODUCT SPECIFICATIONS

DOUBLE STRAP SERVICE SADDLES

Minimum Requirements:

- Meet or exceed AWWA C800, latest revision.
- Shall be double strap design.
- Saddle material shall be ductile iron conforming to ASTM A536.
- Material for the straps, bales, nuts, and washers shall be stainless steel 304 or better.
- Straps shall tighten to conform to the curvature of the pipe.
- An O-Ring gasket confined in a retaining groove shall seal as the straps are tightened.
- The saddle shall have an outlet for the service connection that will accommodate an NPT or AWWA thread.
- Shall have a factory applied epoxy coating.
- Gasket material shall be chloramines resistant for potable water applications.





PRE-APPROVED MANUFACTURERS:

- JCM (406) *[CRTag]
- SMITH-BLAIR (Series 317) *[CRTag]
- ROMAC (202NS, 202NU) *[CRTag]
- FORD METER BOX (FC202, FCD202) *[CRTag]
- A.Y.McDONALD MFG. CO. (4825A, 4826A, 4855A, 4856A)
- MUELLER

Date: September 17, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 205, 206, 221, 222

Sheet Number	5.5

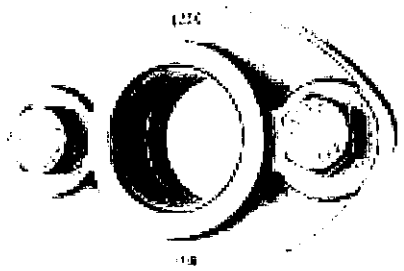
BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

METER FLANGE FOR WATER SERVICES

Minimum Requirements:

- Meet or exceed AWWA C800, latest revision.
- Working pressure of 150 psi, minimum.
- Material for the nuts and bolts shall be stainless steel.



PRE-APPROVED MANUFACTURERS:

- CAMBRIDGE BRASS (421, 424)
- FORD METER BOX
- MUELLER
- A.Y.McDONALD MFG. CO. (610F, 610M)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 226, 227, 228

Sheet Number	5.6

BROWARD COUNTY
FLORIDA

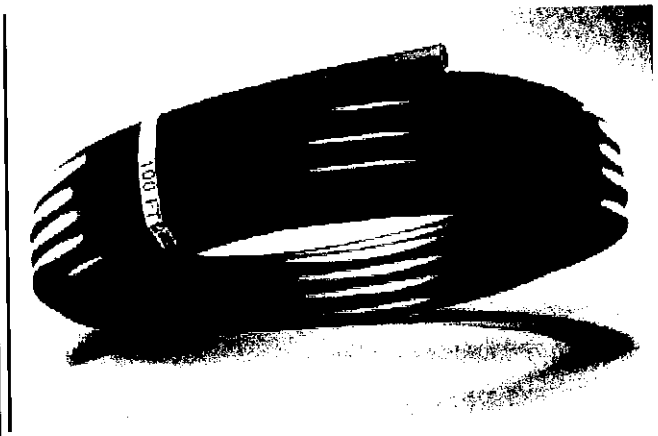
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

POLYETHYLENE TUBING FOR 1" AND 2" WATER SERVICES

Minimum Requirements:

- Meet or exceed AWWA C901.
- Shall be SDR 9.
- Have surfaces free from bumps and irregularities.
- Comply with ASTM 3350 providing for an inner and outer layer of UV protection for 5 years in direct sunlight.
- Display labels at intervals of not more than 5 feet which convey the following information:
  - -Manufacturer's name
  - -Brandname or Trademark
  - -Nominal size
  - -HDPE designation code
  - -Standard dimension ratio (SDR)
  - -Pressure Class: PC 200
  - -AWWA C901
  - -Mark or seal of the testing agency
- Fittings shall be of the compression type utilizing a totally confined grip seal and coupling nut.
- Stainless steel tube stiffener insert shall be used for tubing services.



PRE-APPROVED MANUFACTURERS:

- PERFORMANCE PIPE (DRISCOPLEX)
- ENDOT ENDOPOLY

Date: September 7, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 221, 222, 224, 226, 227, 228

Sheet Number	5.7

BROWARD COUNTY
FLORIDA

Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

TYPE K COPPER TUBING FOR 1" AND 2" WATER SERVICES

Minimum Requirements:

- Meet or exceed the requirements of AWWA C800, Section A.2 and ASTM B88, latest revisions.
- Pipe material shall be Type K Copper.
- Threaded fittings for underground tubing shall be of the compression type utilizing a totally confined grip seal and coupling nut.
- Soldered fittings are acceptable on aboveground tubing.

PRE-APPROVED MANUFACTURERS:

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 206, 221, 222, 224, 226, 227, 228, 235, 236, 237

BROWARD COUNTY
FLORIDA

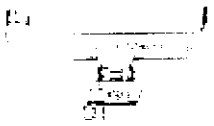
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

U-BRANCH

Minimum Requirements:

- Meet or exceed the requirements of AWWA C800, latest revisions.
- Working pressure shall be 150 psi, minimum.



PRE-APPROVED MANUFACTURERS:

- A.Y.McDONALD MFG. CO.
- CABRIDGE BRASS
- FORD METER BOX
- MUELLER

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 227

Sheet Number	5.9

BROWARD COUNTY FLORIDA

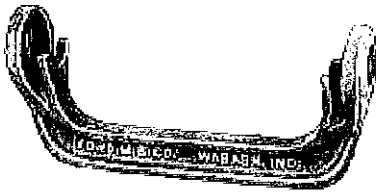
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

YOKES

Minimum Requirements:

- Spacing shall accommodate meter lengths as described in AWWA C800, latest revision.
- Body material shall be cast iron conforming to ASTM A48 or A126.
- Not permitted on new construction.



PRE-APPROVED MANUFACTURERS:

- FORD METER BOX (IRON YOKE BARS, Y500 SERIES)
- MUELLER (IRON METER YOKES, H-5020)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	5.10

BROWARD COUNTY FLORIDA

Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

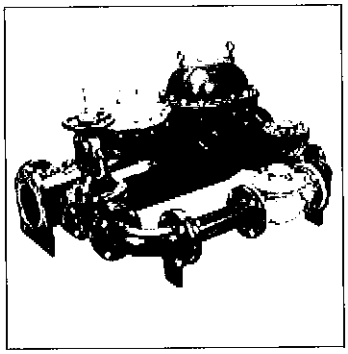
PRODUCT SPECIFICATIONS

COMPOUND FIRELINE WATER METER

Minimum Requirements:

- Meet or exceed the requirements of AWWA C703, latest revision.
- Shall be UL listed or FM approved.
- Flanges shall conform to ANSI 16.1 Class 125.
- Compound fire line water meters are intended for use where an extremely wide flow range is required and where measurement of both domestic and fire service water usage is desired.
- Maincase material shall be bronze, cast iron, or ductile iron.
- Bypass meter casing material shall be bronze*.
- The high-capacity and by-pass meter registers shall have a magnetic drive.
- The register shall be permanently sealed, tamper resistant, and have a standard gear ratio for interchangeability.
- Operating pressure shall be 150 psi, minimum.
- Transition between the low-flow and main-line meter shall be controlled by an internal, automatic device.*

*Not required for Sensus Omni F2 as it does not have an external bypass meter.



PRE-APPROVED MANUFACTURERS:

- SENSUS (Omni F2)
- HERSEY METERS (Model MFM II)

Date: July 26, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	6.1

BROWARD COUNTY
FLORIDA

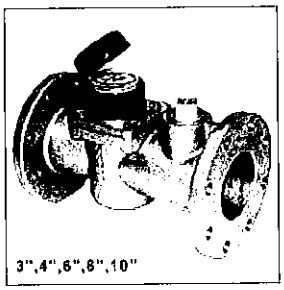
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

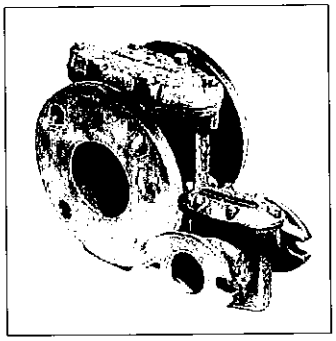
PRODUCT SPECIFICATIONS

WATER METER (4", 6", 8")

Minimum Requirements:

- Meet or exceed AWWA C701, latest revision.
- Meters shall be the Class II turbine type meter assembly.
- Maincase material shall be bronze or epoxy coated ductile iron.
- Strainer body material shall be bronze or epoxy coated ductile iron or cast iron.
- Strainer and fastener material shall be stainless steel.
- Registers shall be permanently sealed, tamper resistant, with a straight reading odometer type display.
- Meters shall have a direct magnetic drive.
- Maximum continuous flow rates may be exceeded up to a minimum of 25% for intermittent periods.
- A strainer is required upstream of the meter.
- The strainer screen area shall have a minimum net open area of at least 2 times the pipe opening.
- Flanges shall conform to ANSI B16.1 Class 125 or Class 150.
- Working pressure shall be 175 psi, minimum.





PRE-APPROVED MANUFACTURERS:

- HERSEY-METERS (HORIZON)
- SENSUS (Omni T2)

Date: July 26, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	6.2

BROWARD COUNTY
FLORIDA

Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

FIRE PROTECTION BY-PASS METER (1")

Minimum Requirements:

- Meet or exceed the Minimum Requirements for Service Meter (5/8", 1", 1 1/2", 2"), Product Specification Sheet 6.4.

PRE-APPROVED MANUFACTURERS:

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 226, 235, 237

Sheet Number	6.3

BROWARD COUNTY
FLORIDA

Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

SERVICE METER (5/8", 1", 1/1/2", 2")

Minimum Requirements:

- Main case material for 5/8" to 2" meters shall be NSF61 approved and certified bronze or plastic composite material.
- Main case shall have NSF61 molded on the body in raised lettering.
- Main case shall have non-corrosive metal, male threaded end connections.
- The manufacturer shall warranty plastic composite main cases for a period of 10 years and bronze, aluminum, and ductile iron main cases for a period of 15 years from the date of shipment.
- All materials used in the construction of the main case shall have sufficient dimensional stability to retain operating clearances at working temperatures up to 105 degrees F.
- The meter serial number shall be permanently marked on the plastic composite main case or engraved onto the bronze, aluminum, or ductile iron main case of the meter on a flat serial number pad parallel to the face of the register so that it is easily visible within the meter box and will not wear down after installation.
- The meter serial number shall begin with the last two digits of the year of manufacture. For example, meter manufactured in 2010 shall have a serial number beginning with 10XXXXX.
- The meter size, model number, manufacturer, and direction of flow shall be molded in raised lettering on the main case.
- Meters shall be of split case bottom entry design for sizes 5/8" and 1".
- Plastic composite bodies shall incorporate non–corrosive metal end connections with male threads of the proper size for easy installation and compatibility with existing metal meter couplings. Plastic threads or end connections will not be accepted. Non-corrosive metal end connections shall be permanently bonded to the meter.
- Meter bodies, except for plastic composite bodies, shall be designed with a male thread connection to the bottom plate so that any expansion due to pressure will not allow the bottom plate to loosen. Female threaded meter body connections to the bottom plate will not be accepted.
- The measuring chamber shall be AWWA compliant to current standards.
- The chamber shall be of the nutating disc or oscillating piston style.
- The chamber magnet shall be a minimum 4-pole magnet an the measuring chamber shall be locked into place with a chamber retainer, as applicable.
- Meters shall meet or exceed AWWA C700 requirements for pressure loss and accuracy. Accuracy requirements shall be met for a period of 5 years from the date of installation.
- Meters shall be 100% factory tested for accuracy and results shall be provided upon request.
- All meters requiring strainers shall be provided with non-corrosive strainer screens installed in the meter.
- Strainers shall be rigid, fit snugly, be easy to remove, and shall have an effective straining area at least twice that of the inlet opening.
- The register shall be magnetically driven with internal gearing and mechanically driven 6-wheel odometer, read in US gallons, and be permanently sealed by the manufacturer.
- The register shall provide for visual registration at the meter.
- The moving odometer wheels shall be of contrasting colors. All digits 1000 gallons and higher must be white wheels with black lettering.
- The numerals on the number wheels of the register shall not be less than 1/4 in height and should be legible at a 45 degree angle.
- Registers shall incorporate a center sweep test hand and a low flow indicator.
- The register shall be secured to the meter main case by a tamper resistant mechanism or casing protection against unauthorized removal of the register and be interchangeable with meters of the same size.
- Direct reading registers shall be housed within a domed register glass to prevent buildup utilizing an engineered, heat treated glass to prevent scratching. Flat glass or beveled register glasses will not be accepted.
- Register box shall be made of bronze or a suitable engineered plastic and have a box lid with stainless steel hinge pins.
- A register and/or meter ID number shall be clearly imprinted on the top of the register and must be capable of being removed while the meter is in service without the need to remove or access the measuring chamber.

PRE-APPROVED MANUFACTURERS:

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 224, 226, 227, 228

BROWARD COUNTY
FLORIDA

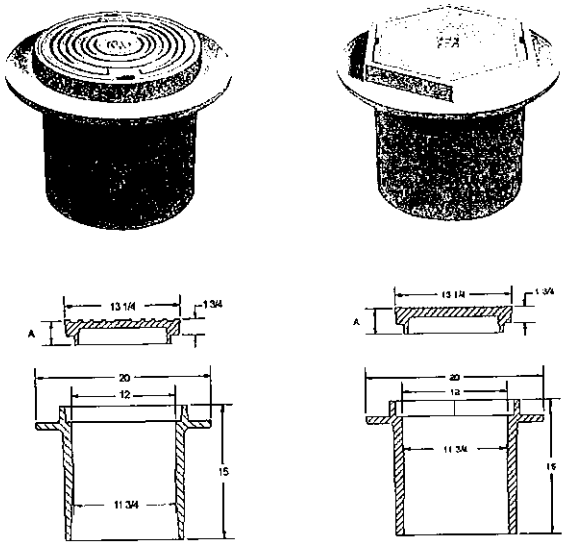
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

BOX AND COVER

Minimum Requirements:

- The box and cover are to be used in casing pipe, manual blow off, and butterfly valve situations.
- The box and cover with extensions are to be used on plug valves.
- Box and cover material shall be cast iron conforming to ASTM A48 Class 35B.



PRE-APPROVED MANUFACTURERS:

- US FOUNDRY (7630)
- US FOUNDRY (7635, Standard Detail Figure 154 only)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 154, 252, 418

BROWARD COUNTY
FLORIDA

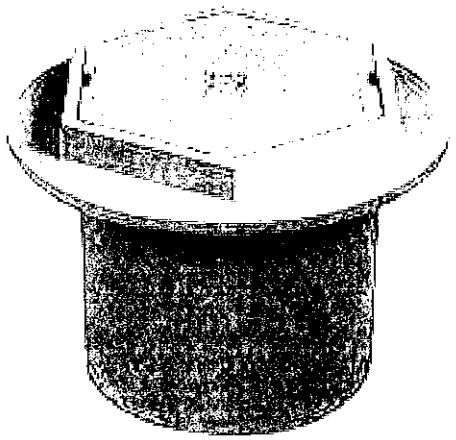
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

CLEANOUT BOX AND COVER

Minimum Requirements:

- Box material shall be polyethylene, cast iron, or ductile iron.
- Cover shall be ductile iron, hexagonal shaped, and marked with "Sewer" or an "S".
- Cover dimensions shall be 11 3/4" ID x 15".
- The cover shall meet or exceed a minimum proof load of 25,000 pounds on a 9" x 9" area.



PRE-APPROVED MANUFACTURERS:

- US FOUNDRY (USF 7635, FJ cover)
- US FOUNDRY (USF 7636, MJ cover)
- CARSON (MSCO-3)

Date: July 14, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 341

Sheet Number	7.2

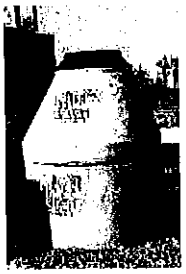
BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

MANHOLE

Minimum Requirements:

- Meet or exceed ASTM C478, latest revision.
- Structure material shall be Type II concrete.
- Shall have an 8" minimum wall and base thickness.
- Base section inside diameters shall be 48", minimum.
- Minimum height of the base section shall be 3 feet from the outside bottom of the base slab. The base section shall be cast monolithically with the bottom section's wall.
- Lifting holes are not permitted.
- Sections shall be joined with a preformed plastic joint sealing compound consisting of either bituminous or butyl rubber base, conforming to Federal Specification SS-S-210A, Type I.
- Sealing compound shall be protected with a two piece cover to prevent adhesion until used, and shall be a minimum of 7/8" by 1-3/8" wide.
- Invert channels shall be smooth and accurately shaped to a semicircular bottom conforming to the inside of the adjacent sewer section.
- Inside drop connections are not permitted.
- Steps or ladders are not permitted.
- Structure shall be designed for a minimum proof load of 25,000 pounds.
- Vertical crush to exceed 18,000 pounds and sidewall load to exceed 200 pounds per square inch.



PRE-APPROVED MANUFACTURERS:

- All manufacturers that meet or exceed ASTM, Florida Department of Transportation, and Broward County Highway Construction and Engineering Division specifications.*

*Requires shop drawing submittal to BCWWS. The drawings shall be signed and sealed by the Engineer of Record for each structure.

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 311, 312, 313, 318, 322

BROWARD COUNTY
FLORIDA

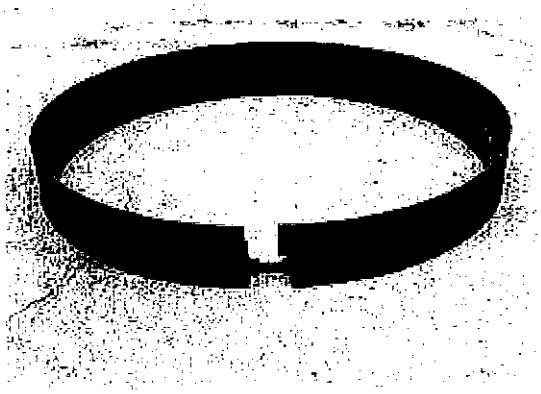
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

MANHOLE RISERS

Minimum Requirements:

- Product shall not be used on new manhole installations.
- Risers shall have an adjustable diameter.
- Riser material shall be A36 Hot roll steel and galvanized metal.
- Stud material shall be stainless steel.



PRE-APPROVED MANUFACTURERS:

- RELL TYPE 1 & 2 (Not approved for new manhole installations)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	7.4

BROWARD COUNTY
FLORIDA

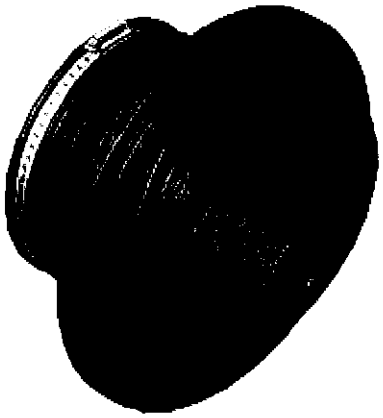
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

MANHOLE CONNECTOR

Minimum Requirements:

- Meet or exceed the testing requirements set forth in ASTM C923-00.
- Body material shall be rubber.
- Hardware material shall be stainless steel.
- Shall provide a flexible, watertight seal between the pipe and concrete structure.
- Shall be cast integrally with the structure wall during the manufacturing process in a manner that it will not pull out during pipe coupling.
- The seal between the connector and the pipe shall be made by compressing the connector against the outside circumference of the pipe.
- Shall allow for deflection and vertical or horizontal movement without loss of seal.



PRE-APPROVED MANUFACTURERS:

- A-LOK Z-LOK (CAST IN BOOT CONNECTOR)
- KOR-N-SEAL I (706 SERIES)

Date: August 13, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 322

Sheet Number	7.5

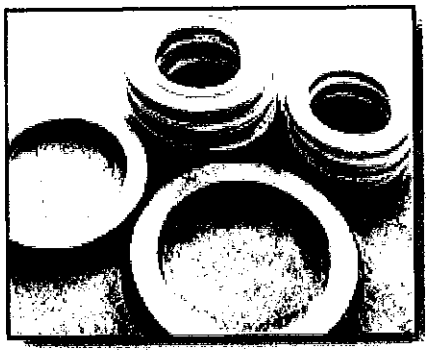
BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

MANHOLE GRADE RINGS

Minimum Requirements:

- Concrete grade rings shall be used on new manhole installations and meet or exceed ASTM C478, latest revisions.
- Concrete grade ring material shall be Type II concrete with a minimum 28 day strength of 4000 psi.
- Plastic manhole grade rings shall be used only in conjunction with an approved chimney seal system when installed on existing manholes and shall meet or exceed ASTM D4976, latest revisions.
- 100% recycled material is preferred for plastic grade rings.
- Plastic grade rings shall be manufactured using the injection molding process and tested to assure compliance with the impact and loading requirements per the ASSHTO Standard Specification for Highway Bridges.
- Plastic grade rings shall be sealed with a butyl sealant in the annular space between the rings and cone basin, the rings, and the rings and cover frame
- Plastic ring Installation shall be per the manufacturer's recommendations.



PRE-APPROVED MANUFACTURERS:

Concrete

- All manufacturers that meet or exceed ASTM, Florida Department of Transportation, and Broward County Highway Construction and Engineering Division specifications.

Plastic

- LADTECH, INC.

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 312, 311, 313

Sheet Number	7.6

BROWARD COUNTY
FLORIDA

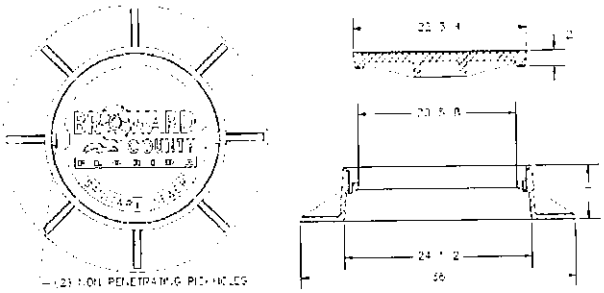
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

MANHOLE RING AND COVER

Minimum Requirements:

- Cover material shall be cast iron or ductile iron conforming to ASTM A48.
- Frame material shall be cast iron or ductile iron conforming to ASTM A48.
- The combined weight of the frame and cover shall not be less than 400 pounds.
- The cover shall weigh a minimum of 160 pounds.
- The seating surfaces between frame and cover shall be machined to fit true and shall be water tight.
- Non-penetrating pick holes will be cast into the lid.
- No plugging or filling will be allowed.



PRE-APPROVED MANUFACTURERS:

- US FOUNDRY (420 LR-ORS, 540 LR-ORS)
- US FOUNDRY (690 AG-M, for Air Release Valve manholes only, County logo not required)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 161

Sheet Number	7.7

BROWARD COUNTY
FLORIDA

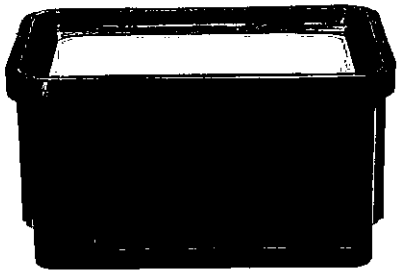
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

METER BOX AND LID

Minimum Requirements:

- The meter box shall be made from high-density 100% homogenous polyethylene material, of one-piece molded construction for durability and impact strength or equal.
- Interior wall shall be smooth finish.
- Wall thickness shall be a minimum of .50 inches with wall core interior are of rigid foam construction and offering insulation and tensile strength.
- Vertical crush to exceed 18,000 pounds and sidewall load to exceed 200 pounds per square inch.
- A flange shall encircle the top area for installation in concrete.
- Meter boxes must be constructed with pre-cut knock-outs for piping. The box shall have removable pre-cut pipe entry areas, 3" wide X 4" high, located on the center of each end (short side) of the box for single meter installations, and 3 pre-cut pipe entry areas (single in, dual out) for dual meter installations.
- Meter box shall meet the dimensions indicated on the Standard Details and shall fit all pre-approved lids so that the lids may be interchanged without adjustment to the meter box.
- Meter box lids shall be ductile iron conforming to ASTM A-536, Grade 60-40-18, current revision.
- Lids shall have reader/window with hinged flap to be located over the meter.
- The meter box lid shall meet or exceed a minimum proof load of 25,000 pounds on a 9" x 9" area.
- Testing shall be verified by an independent third party.
- All meter box lids shall have a minimum of 10 (ten) years limited warranty.



PRE-APPROVED MANUFACTURERS:

- CARSON BRAND (BOX)
- OLD CASTLE/ EAST JORDAN IRON WORKS (LID)
- EBAA IRON (LID)
- DFW (DWF39C-12-BODY and DFW1324C-12-BODY BOXES)

Date: October 26, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 226, 227, 228

Sheet Number	7.8

BROWARD COUNTY
FLORIDA

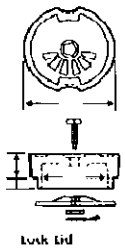
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

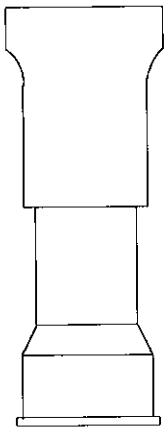
PRODUCT SPECIFICATIONS

VALVE BOX

Minimum Requirements:

- Valve boxes shall be cast iron ASTM-A48, extension, adjustable screw type.
- Shaft diameter shall be 5-1/4".
- Covers shall be labeled per the standard detail.
- Extensions 18" through 24" are acceptable.
- All lids shall be locking type.
- The stem of a buried valve shall be within 18" of the finished grade.





PRE-APPROVED MANUFACTURERS:

- TYLER UNION
- STAR PIPE PRODUCTS
- US FOUNDRY

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: 121, 123, and 418

BROWARD COUNTY
FLORIDA

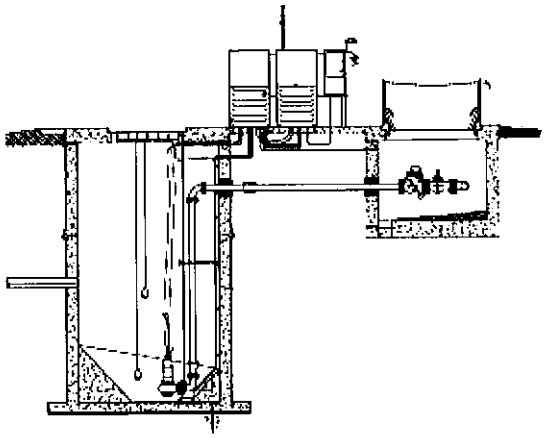
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

WETWELL AND VALVE PIT STRUCTURES

Minimum Requirements:

- The standard lift station detail drawings are a part of these specifications and contain the latest information on WWS lift station requirements.



PRE-APPROVED MANUFACTURERS:

- Any manufacturer who meets ASTM, FDOT, and Broward County Specifications.*

*Wetwells installed by the Tremie Seal method require shop drawing submittal to BCWWS. The drawings shall be signed and sealed by the Engineer of Record.

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: Lift Station Details

Sheet Number	7.10

BROWARD COUNTY
FLORIDA

Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

COATING FOR EXTERNAL DUCTILE IRON PIPE AND NON-WET CONCRETE SURFACES

Minimum Requirements:

- Surface preparations, priming, and application shall be in accordance with the more stringent of the manufacturers recommendations or the BCWWS specifications.
- Composition shall be 100% solids polyamine epoxy and provide resistance against the corrosion caused by hydrogen sulfide found in wastewater.
- Coating color shall be beige.
- Coating shall be suitable for application in confined spaces.

PRE-APPROVED MANUFACTURERS:

- TNEMEC PERMA-GLAZE 435
  (In extreme wastewater environments, prime non-concrete surfaces with Series 218 Mortarclad)

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: BCWWS Lift Station Details

BROWARD COUNTY
FLORIDA

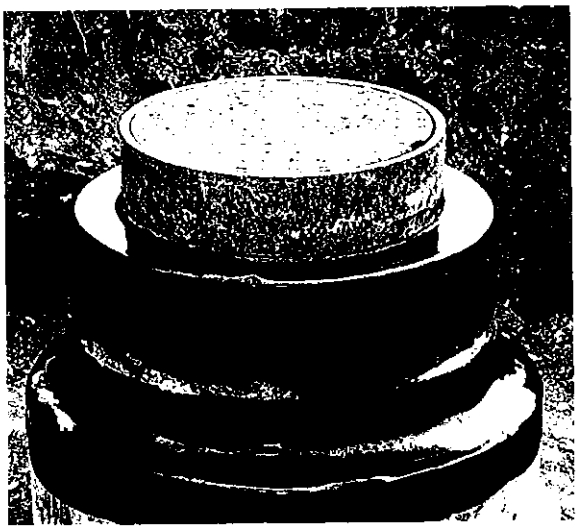
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

MANHOLE CHIMNEY SEAL

Minimum Requirements:

- Shall be a wrap system or approved equal. Alternative systems will be considered on a case-by-case basis.
- System shall use a heat shrinkable wraparound sleeve to create a barrier to water infiltration and protect the structure from ground moisture.
- Shall provide for a water tight seal between the cone and cover.
- Shall bond to primed concrete and metal surfaces.
- Shall have a 40% minimum shrink factor.
- Maximum water absorption shall be .05% per ASTM D 570 (Standard Test Method for Water Absorption of Plastics).
- Adhesive shall be heat activated .



PRE-APPROVED MANUFACTURERS:

- WRAPIDSEAL

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	8.2

BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

WETWELL, VALVE PIT, & MANHOLE COATINGS

Minimum Requirements:

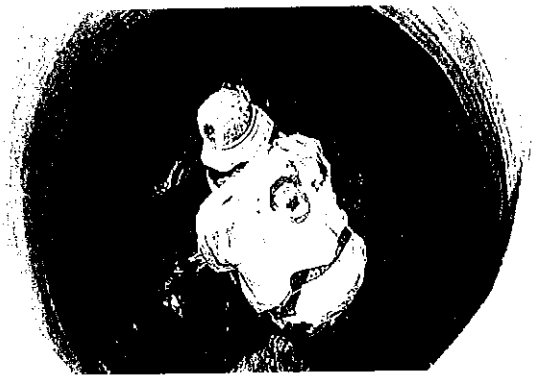
- Application of the coating shall be in accordance with the manufacturer's specification.
- Preparation of the surface shall meet or exceed BCWWS requirements.
- Coating shall meet or exceed the latest revisions of ASTM C78, C109, C138, C157, C293, C457, C496, C580, D638, C642, D695, C666, C882, C1202, D2240, and D4541, as applicable.
- Shall provide resistance against the corrosion caused by hydrogen sulfide found in wastewater as well as other industrial chemicals.
- Shall cure in damp environments.
- Shall be suitable for application in confined spaces.
- Coating levels are defined as follows:

  Level I: new or rehabilitated surface, non-corrosive to slightly corrosive environment;
  - **Composition:** Coal tar epoxy

  Level II: new or rehabilitated surface, corrosive environment (medium—high);
  - **Composition:** Cement mortar with abrasion and corrosion-resistant qualities

  Level III: new or rehabilitated surface, highly corrosive and abrasive environment;
  - **Composition:** 100% solids cyclo-aliphatic amine -cured epoxy coating

- The coating shall be Level II or Level III in highly corrosive areas, as directed by BCWWS.
- New or rehabilitated surfaces in areas designated Level III shall be coated with sprayable, high-build, moisture tolerant, chemical resistant, epoxy coating designed to be applied on dry or damp concrete surfaces and yielding a hard, durable, chemical resistant finish to a pH of 1.



PRE-APPROVED MANUFACTURERS:

LEVEL I
- CARBOLINE 300M

LEVEL II
- SEWPER COAT
- BASF SP15

LEVEL III
- BASF SEWER GUARD HBS 100 EPOXY LINER

Date:	June 23, 2010
Date Last Issued:	June 23, 2010
Date First Issued:	June 23, 2010
Standard Detail:	Standard Lift Station Details, 311, 312, 313

Sheet Number	8.3

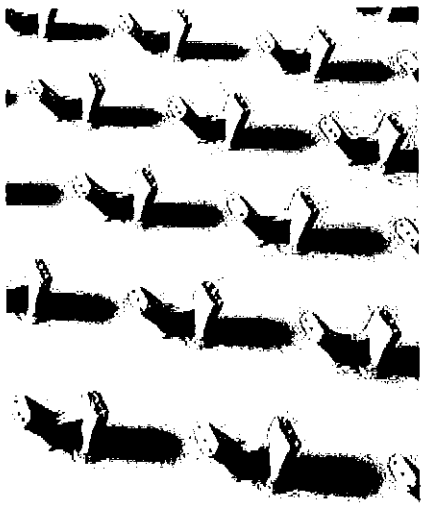
BROWARD COUNTY
FLORIDA

Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

WETWELL, VALVE PIT, & MANHOLE LINERS

- Shall be approved on a case-by-case basis by the WWS Technical Standards Committee.



PRE-APPROVED MANUFACTURERS:

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail:

Sheet Number	8.4

BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

SUBMERSIBLE WASTEWATER PUMPS (3-100 HP)

Minimum Requirements:

- Provide Factory Mutual Explosion Proof listed submersible sewage pumps suitable for continuous duty operation underwater without loss of watertight integrity to a minimum depth of 50 feet for the Water and Wastewater Services/ Water and Wastewater Operations Division (WWS/WWOD). Pump system design shall include an Ebara/Flygt or Equal compatible guide rail system such that the pump will be automatically connected to the discharge piping when lowered into place on the discharge connection. The pump shall be easily removable for inspection or service, requiring no bolts, nuts, or other fasteners to be disconnected, or the need for personnel to enter the wet well. The motor and pump shall be designed, manufactured, and assembled by the same manufacturer.
- All major parts of the pumping unit(s) including casing, impeller, suction cover, motor frame and discharge elbow shall be manufactured from gray cast iron, ASTM (American Society for Testing and Materials) A-48 Class 30 minimum.
- Castings shall have smooth surfaces devoid of blowholes or other casting irregularities.
- Casing design shall be centerline discharge with a large radius on the cutwater to prevent clogging.
- Units shall be furnished with an Ebara/Flygt compatible discharge elbow that has a 125 lb. flat face ANSI (American National Standards Institute) flange on the discharge side.
- All exposed bolts and nuts shall be 304 stainless steel.
- All mating surfaces of major components shall be machined and fitted with NBR (Nitrile butadiene rubber) o-rings where watertight sealing is required.
- Machining and fitting shall be such that sealing is accomplished by automatic compression of o-rings in two planes and o-ring contact is made on four surfaces without the requirement of specific torque limits.
- Internal and external surfaces are prepared to SPPC-VISI-SP -3-63 then coated with a zinc-chromate primer.
- The external surfaces are then coated with a coal tar epoxy specifically designed for use in wastewater applications.
- The impellers shall be single or multi-vane, semi-open or enclosed design. The impellers shall be unshaved.
- The impellers shall be dynamically balanced and shall be designed for solids handling with a long thru let without acute turns.
- The impellers shall pass 3" solids.
- The inlet edge of the impeller vanes shall be angled toward the impeller periphery.
- The impeller design shall include back pump out vanes.
- A lip seal shall be located behind the impeller hub.
- The design shall include a replaceable cast iron wear ring/ plate.
- The wear ring shall be designed such that it may be adjusted to maintain working clearances and hydraulic efficiencies.
- The manufacturer shall offer vortex impellers on pumps 3 to 30 HP as a standard option.
- The design shall include replaceable shoe adapter plates.
- There shall be a replaceable rubber gasket interface between the base elbow and pump discharge for pumps under 50 HP. Pumps larger than 50 HP shall have a replaceable wear plate.
- Pumps shall be designed to include a double mechanical seal in a cartridge mounted or tandem arrangement.
- Each seal shall be positively driven and act independently with its own spring system.
- The oil filled seal chamber shall be designed to prevent over-filling and include an anti-vortexing vane to insure proper lubrication of both seal faces.
- Lower face materials shall be silicon carbide, upper faces carbon vs. ceramic, NBR elastomers, and 304 stainless steel hardware.
- Seal system shall not rely on pumping medium for lubrication.
- The pump motor shall be an air filled induction type with a squirrel cage rotor, shell type design, built to NEMA (National Electrical Manufacturers Association) MG-1, Design B specifications.
- The motor shall be rated by Factory Mutual as Explosion Proof and suitable for operation in Class 1, Division 1, Groups C & D environments. Ratings by other agencies are not acceptable and will not be considered.

PRE-APPROVED MANUFACTURERS:

Date: See Next Page
Date Last Issued: See Next Page
Date First Issued: See Next Page
Standard Detail: See Next Page

Sheet Number	9.1

BROWARD COUNTY FLORIDA
Water & Wastewater Services
Engineering Division
2555 West Copans Road
Pompano Beach, Florida
33069
Tel 954-831-0745
FAX 954-831-0798

PRODUCT SPECIFICATIONS

SUBMERSIBLE WASTEWATER PUMPS (3-100 HP)

Minimum Requirements (Cont'd):

- The pump motor will be furnished with a large lifting bail constructed of stainless steel. Lifting rings are not acceptable. The bail shall not be an integral part of any other pump casting/housing. The bail shall be replaceable.
- The lifting bails must provide proper balance to the pump so that it is tilted to properly engage the guide rail system and base elbow.
- 3 HP through 60 HP models shall be capable of operating on 208, 230 or 460 volts without requiring a special stator.
- 75 HP and larger shall operate on 460 volts.
- Stator windings shall be copper, insulated with moisture resistant Class F insulation, rated for 311°F.
- The stator shall be dipped and baked in Class F varnish and heat shrunk fitted into the stator housing.
- Rotor bars and short circuit rings shall be manufactured of cast aluminum.
- Motor shaft shall be one piece stainless steel rotating on two permanently grease lubricated ball bearings designed for a minimum L-10 life of 60,000 hours.
- On pumps 3 to 60 HP the motor service factor shall be 1.15 rated for a maximum of 10 starts per hour.
- Pumps 75 HP and larger shall have a 1.10 motor service factor rated for a maximum of 10 starts per hour.
- The motor junction area shall use either rings eyes or a terminal board to connect the power cables to the stator leads.
- The motor shall be designed for continuous duty pumping in a dry environment or at a maximum sump temperature of 120° F.
- Voltage and frequency tolerances shall be a maximum 10 / 5% respectively.
- Motor over temperature protection shall be provided by three (3) thermal protectors (klixons) embedded in the windings.
- The (3) klixons shall be normally closed and embedded, one in each of the three phases. The klixons shall be wired in series.
- A system to detect mechanical seal failure shall be provided.
- Motors 75 HP and larger shall be capable of being furnished with an integral cooling jacket.
- Power cable jacket shall be manufactured of an oil resistant chloroprene rubber material designed for submerged applications.
- The cable entry seal shall be watertight to a depth of 50 feet.
- The cable entry system shall be the same for both the power and control cables. The power and sensor cable furnished must be a minimum of 60' long.
- The pump design shall include an Ebara/Flygt compatible discharge flange suitable for guiding the pump on two (2) 304 stainless steel schedule 40 guide rails sized to mount directly to a base elbow at the floor of the wet well and to a stainless steel guide rail bracket at the top of the wet well below the hatch opening. Guide cables are not an acceptable substitute for guide rails.
- The proposed pump guide rail system shall be fully compatible and interchangeable with systems currently installed and in use in the WWS system.
- Pumps 3 HP to 30 HP will use 2 inch Schedule 40 stainless steel double guide rails.
- Pumps 40 HP and larger will use 3 inch Schedule 40 stainless steel double guide rails.
- The Ebara/Flygt compatible base elbow shall be manufactured of cast iron, ASTM A48 Class 30 minimum.
- The base elbow shall be designed to adequately support the guide rails, discharge piping, and pumping unit under both static and dynamic loading conditions with support legs that are suitable for anchoring it to the wet well floor. The entire weight of the pump unit shall be guided to and wedged tightly against the inlet flange of the base elbow.
- The face of the inlet base elbow flange shall be perpendicular to the floor of the wet well.
- The discharge flange of the base elbow shall conform to ANSI B16.1 Class 125.
- The pump design shall include a self-aligning sliding bracket.
- Sealing of the pumping unit to the base elbow shall be accomplished by a single, linear, downward motion of the pump.

PRE-APPROVED MANUFACTURERS:

Date: June 23, 2010
Date Last Issued: June 23, 2010
Date First Issued: June 23, 2010
Standard Detail: Standard Lift Station Details

Sheet Number	9.1(Cont'd)

10. Product Specification Submittal Form

(This page intentionally left blank)

BROWARD COUNTY
FLORIDA
Public Works Department • Water & Wastewater Services
WATER & WASTEWATER ENGINEERING DIVISION
2555 West Copans Road • Pompano Beach, Florida 33369 • 954-831-0745 • FAX 954-831-0798/0925

PRODUCT SPECIFICATION SUBMITTAL FORM

Project Name	_____	Date	_____
Project Number	_____	Contract Number	_____
Contractor Name	_____	Phone	_____
Address	_____	Fax	_____

The purpose of this form is to identify the products that will be used during construction on the above-named project. Products are organized in tables that group like items. For example, fire hydrants are grouped in one table separate from gate valves and non-pressure pipe is separated from pressure pipe. Place a check next to *one* option within the table for each product group. Shop drawing submittals to the Engineer of Record and WWS Technical Standards Committee are required when the option 'Other' is chosen. Typically, only one manufacturer for a given product should be used throughout the project. In the unusual circumstance that products from multiple manufacturers are approved by the WWS Technical Standards Committee for the same item (for example, both Mueller and Clow fire hydrants are installed within the same project), then the record drawings for the project must indicate the manufacturer and model installed at each location.

Chloramine resistance is required for rubber material in contact with potable water. Several manufacturers either provide chloramine resistant material as the standard configuration of their product or offer chloramine resistant material as an option to be specified at the time of purchase. In the case where chloramine resistant material is an optional purchase item, the products have been identified with the label *[CRTag]*. Products with the *[CRTag]* label must be delivered to the construction site with a factory applied tag stating the name of the material used and that the compound is chloramine resistant.

The space below has been provided for the Engineer of Record's and Contractor's approval stamps.

Pipe

1.1 Ductile Iron Pipe & Fittings (Select one)

Manufacturer	Check
Not used on project	
ACIPCO	
US Pipe	
McWane	
Clow	
Griffin Pipe	
Other (Shop drawing submittal required)	

1.2 High Density Polyethylene Pipe (4" and Above) & Fittings (Select one)

Manufacturer	Check
Not used on project	
ISCO (Ductile Iron pipe size)	
JM Eagle (Ductile Iron pipe size)	
Other (Shop drawing submittal required)	

1.3 PVC C900/C905 Pressure for Gravity Sewer and Reclaimed Water (Select one)

Manufacturer	Check
Not used on project	
Diamond Plastics Corp.	
JM Eagle	
Certain Teed	
Sanderson Pipes	
North American Pipe	
Other (Shop drawing submittal required)	

1.4 PVC SDR-26 Non-Pressure Pipe (Select one)

Manufacturer	Check
Not used on project	
Diamond Plastics Corp.	
JM Eagle	
Sanderson Pipes	
North American Pipe	
Other (Shop drawing submittal required)	

Fittings and Accessories

2.1 Casing Spacers for Carrier Pipe 6" and Above (Select one)

Manufacturer	Check
Not used on project	
PSI (S8G-2, S12G-2)	
Cascade Waterworks Mfg. (CCS)	
Advanced Products & Systems, Inc. (SSI8, SSI12)	
Other (Shop drawing submittal required)	

2.2 Fire Hydrants (Select one)

Manufacturer	Check
Not used on project	
Mueller High Security Super Centurion (250, A-423) *[CRTag]	
Clow Medallion *[CRTag]	
American Darling (B-84-B) *[CRTag]	
American AVK Classic Style	
US Pipe Metropolitan M-94 *[CRTag]	
Other (Shop drawing submittal required)	

2.3 Flanged Fittings (Select one)

Manufacturer	Check
Not used on project	
ACIPCO *[CRTag]	
US Pipe *[CRTag]	
Star Pipe Products *[CRTag]	
Tyler Union (Water main only) *[CRTag]	
Sigma (Water main only) *[CRTag]	
Other (Shop drawing submittal required)	

2.4 Flexible Coupling (Select one)

Manufacturer	Check
Not used on project	
Fernco (Standard, SS Shear Rings, Strong Back RC, 5000 Series Strong Back, No-Hub)	
Mission	
Other (Shop drawing submittal required)	

2.5 Mechanical Joint Fittings (Select one)

Manufacturer	Check
Not used on project	
ACIPCO (Fastite) *[CRTag]	
US Pipe (Trim Tyton, Tyton) *[CRTag]	
Star Pipe Products *[CRTag]	
Tyler/Union (Tyton, Water main only) *[CRTag]	
Sigma (Trim Tyton, Water main only) *[CRTag]	
Other (Shop drawing submittal required)	

2.6 PVC SDR-26 Fittings for Gravity Sewer up to 12' In Depth (Select one)

Manufacturer	Check
Not used on project	
Harco	
Plastic Trends	
Multi-Fittings	
Other (Shop drawing submittal required)	

2.7 Tapping Sleeve (Select one)

Ductile Iron

Manufacturer	Check
Not used on project	
American Flow Control (2800 Series)	
Tyler Union	
Mueller (H-615 Series)	
US Pipe (Type 9)	
Other (Shop drawing submittal required)	
16" and larger requires shop drawing submittal	

Stainless Steel

Not used on project	
JCM (432)	
Ford Meter Box (Style FTSS)	
Smith Blair (663)	
Mueller (H-304)	
Romac (Series SST)	
Cascade (CST-EX)	
Other (Shop drawing submittal required)	
16" and larger requires shop drawing submittal	

2.8 Transition Couplings (Select one)

Manufacturer	Check
Not used on project	
JCM Industries (212) *[CRTag]	
Smith Blair (441)	
Other (Shop drawing submittal required)	

Adapters and Joint Restraints

3.1 Bell Joint Restraint for Ductile Iron and PVC Pipe (Select one)

Ductile Iron Pipe

Manufacturer	Check
Not used on project	
Sigma (PV Lok)	
EBBA Iron (1700 Megalug Harness)	
Other (Shop drawing submittal required)	

PVC Pipe

Not used on project	
EBBA Iron (Series 1600 PV, Series 1500 PV)	
Ford Meter Box (Uni-Flange Series 1390)	
Sigma (PV Lok)	
Other (Shop drawing submittal required)	

3.2 Ductile Iron Flange Adapters (Select one)

Manufacturer	Check
Not used on project	
EBBA Iron (Series 2100)	
Other (Shop drawing submittal required)	

3.3 Gripping Ring Mechanical Joint Restraint for Ductile Iron and PVC (Select one)

Ductile Iron Pipe

Manufacturer	Check
Not used on project	
Romac (Grip Ring) *[CRTag]	
ACIPC Fast Grip Gaskets *[CRTag]	
Other (Shop drawing submittal required)	

PVC Pipe

Not used on project	
Romac (Grip Ring) *[CRTag]	
Other (Shop drawing submittal required)	

3.4 Mechanical Joint Restraint for Ductile Iron and PVC Pipe (Select one)

Ductile Iron Pipe

Manufacturer	Check
Not used on project	
EBBA Iron (Megalug Series 1100) *[CRTag]	
Romac (Roma Grip) *[CRTag]	
Ford Meter Box (Uni-Flange Series 1400) *[CRTag]	
Star Pipe Products (Stargrip Series 3000) *[CRTag]	
Sigma (One-Lok SLD) *[CRTag]	
Other (Shop drawing submittal required)	

PVC Pipe

Not used on project	
Ford Meter Box (Uni-Flange Series 1500) *[CRTag]	
EBBA IRON (Megalug Series 2000 PV) *[CRTag]	
Star Pipe Products (Stargrip Series 4000) *[CRTag]	
Sigma (One-Lok SLC) *[CRTag]	
Other (Shop drawing submittal required)	

Valves

4.1 Air Release Valves for Potable Water and Reclaimed Water (Select one)

Manufacturer	Check
Not used on project	
Golden-Anderson (#920, #922) *[CRTag]	
Crispin (PL10, PL10A, PL20, PL20A) *[CRTag]	
Other (Shop drawing submittal required)	

4.2 Air Release Valves for Wastewater (Select one)

Manufacturer	Check
Not used on project	
Golden-Anderson (#929)	
Crispin (S Series)	
Other (Shop drawing submittal required)	

4.3 Automatic Blowoff (Select one)

Manufacturer	Check
Not used on project	
Hydro-Guard Standard Unit	
Kupferle Foundry Co. (9400 WC Eclipse)	
Other (Shop drawing submittal required)	

4.4 Butterfly Valves (12" and Larger) (Select one)

Manufacturer	Check
Not used on project	
Mueller (Lineseal III) *[CRTag]	
Val-Matic *[CRTag]	
Milliken *[CRTag]	
Pratt (#2MII, #2FII,Triton-XR70) *[CRTag]	
Other (Shop drawing submittal required)	

4.5 Check Valves for Lift Stations (Select one)

Manufacturer	Check
Not used on project	
M&H (159-02)	
Mueller (2600-6-01)	
American Flow Control (Series 50-SC)	
Golden Anderson (Figure 220)	
Clow (5380)	
Other (Shop drawing submittal required)	

4.6 Check Valves for Potable Water (Select one)

Manufacturer	Check
Not used on project	
Mueller (Flexible Disc) *[CRTag]	
Danfoss Flo-Flex (745) *[CRTag]	
AFC Series 2100 (flanged by flanged)	
AFC 2100 Hydrant Security Check Valve (MJ by solid gland)	
Other (Shop drawing submittal required)	

4.7 Double Disc Gate and Tapping Valve (12" – 48") (Select one)

Manufacturer	Check
Not used on project	
Mueller (A-2380, H-667) *[CRTag]	
Kennedy Valve *[CRTag]	
Clow Valve *[CRTag]	
M&H Valve *[CRTag]	
Other (Shop drawing submittal required)	

4.8 Eccentric Plug Valves (Select one)

Manufacturer	Check
Not used on project	
Dezurik (PEF)	
Milliken Valve Co. (Series 600/601)	
Henry Pratt	
Other (Shop drawing submittal required)	

4.9 Gate and Tapping Valve (10" and Under) (Select one)

Manufacturer	Check
Not used on project	
American Flow Control (2500 Series)	
American AVK	
Clow (2639) *[CRTag]	
Kennedy Valve *[CRTag]	
Mueller (A2360, T2360) product tag must end with 0331 which indicates chloramines resistance	
Other (Shop drawing submittal required)	

4.10 Insertion Valves (Select one)

Manufacturer	Check
Not used on project	
Other (Shop drawing submittal required)	

Water Service Lines and Appurtenances

5.1 Check Valves for Water Services (Select one)

Manufacturer	Check
Not used on project	
Ford Meter Box (HS11-444 [1"], HS11-777 [2"])	
Other (Shop drawing submittal required)	

5.2 Corporation Stop (Select one)

Manufacturer	Check
Not used on project	
Ford Meter Box (FB-1000)	
Mueller (B-25008) *[CRTag]	
Cambridge Brass (301) *[CRTag]	
A.Y. McDonald Mfg. Co. (4701B-22)	
Other (Shop drawing submittal required)	

5.3 Coupling and Adapters for Water Services (Select one)

Manufacturer	Check
Not used on project	
Cambridge Brass (105, 117, 119, 417)	
Mueller	
Ford Meter Box	
A.Y. McDonald Mfg. Co. (4761-22, 4753-22, 4754-22, 4758-22, 4620)	
Other (Shop drawing submittal required)	

5.4 Curb Stop/ Meter Valve (Select one)

Manufacturer	Check
Not used on project	
Ford Meter Box Straight Ball Valves (B41-444, B41-777)	
Ford Meter Box Ball Meter Valves(B43-444W, B43-344W, BF43-777W)	
Mueller 300 Ball Curb Valves (P25122) *[CRTag]	
Mueller 300 Ball Straight Meter Valves (P24335, P24350) *[CRTag]	
Cambridge Brass (210, 212, 292) *[CRTag]	
A.Y. McDonald Mfg. Co. (4602B-22, 74602B-22, 6101MW, 76101MW, 6100MW-22, 76100MW-22)	
Other (Shop drawing submittal required)	

5.5 Double Strap Service Saddles (Select one)

Manufacturer	Check
Not used on project	
JCM (406) *[CRTag]	
Smith Blair (Series 317) *[CRTag]	
Romac (202NS, 202NU) *[CRTag]	
Ford Meter Box (FC202, FCD202) *[CRTag]	
A.Y. McDonald Mfg. Co. (4825A, 4826A, 4855A, 4856A)	
Mueller	
Other (Shop drawing submittal required)	

5.6 Meter Flange for Water Services (Select one)

Manufacturer	Check One
Not used on project	
Cambridge Brass (421, 424)	
Ford Meter Box	
Mueller	
A.Y. McDonald Mfg. Co. (610F, 610M)	
Other (Shop drawing submittal required)	

5.7 Polyethylene Tubing for 1" and 2" Water Services (Select one)

Manufacturer	Check
Not used on project	
Performance Pipe (Driscoplex)	
Endot Endopoly	
Other (Shop drawing submittal required)	

5.8 Type K Copper Tubing for 1" and 2" Water Services (Select one)

Manufacturer	Check
Not used on project	
Other (Shop drawing submittal required)	

5.9 U-Branch (Select one)

Manufacturer	Check
Not used on project	
A.Y. McDonald Mfg. Co.	
Cambridge Brass	
Ford Meter Box	
Mueller	
Other (Shop drawing submittal required)	

5.10 Yokes (Select one)

Manufacturer	Check
Not used on project	
Ford Meter Box (Iron Yoke Bars, Y500 Series)	
Mueller (Iron Meter Yokes, H-5020)	
Other (Shop drawing submittal required)	

Meters

6.1 Compound Fireline Water Meter (Select one)

Manufacturer	Check
Not used on project	
Sensus (Omni F2)	
Hersey Meters (Model MFM II)	
Other (Shop drawing submittal required)	

6.2 Water Meter (4", 6" 8") (Select one)

Manufacturer	Check
Not used on project	
Hersey Meters (Horizon)	
Sensus (Omni T2)	
Other (Shop drawing submittal required)	

6.3 Fire Protection By-Pass Meter (1") (Select one)

Manufacturer	Check
Not used on project	
Other (Shop drawing submittal required)	

6.4 Service Meter (5/8", 1", 1 ½", 2") (Select one)

Manufacturer	Check
Not used on project	
Other (Shop drawing submittal required)	

System Structures, Boxes, and Covers

7.1 Box and Cover (Select one)

Manufacturer	Check
Not used on project	
US Foundry (7630)	
US Foundry (7635, Standard Detail Figure 154 only)	
Carson (MSCO-3)	
Other (Shop drawing submittal required)	

7.2 Cleanout Box and Cover (Select one)

Manufacturer	Check
Not used on project	
US Foundry (USF 7635, FJ Cover)	
US Foundry (USF 7636, MJ Cover)	
Other (Shop drawing submittal required)	

7.3 Manhole (Select one)

Manufacturer	Check
Not used on project	
Shop drawing submittal required	

7.4 Manhole Risers (Select one)

Manufacturer	Check
Not used on project	
Rell (Type 1 & 2, Not approved for new manhole installations)	
Other (Shop drawing submittal required)	

7.5 Manhole Connector (Select one)

Manufacturer	Check
Not used on project	
A-LOK Z-LOK (Cast in Boot Connector)	
KOR-N-SEAL 1 (706 Series)	
Other (Shop drawing submittal required)	

7.6 Manhole Grade Rings (Select one)

Manufacturer	Check
Not used on project	
Concrete	
Ladtech, Inc (Plastic, for use with approved manhole chimney seal system only)	
Other (Shop drawing submittal required)	

7.7 Manhole Ring and Cover (Select one)

Manufacturer	Check
Not used on project	
US Foundry (420 LR-ORS, 540 LR-ORS)	
US Foundry (690 AG-M, for Air Release Valve manholes only, County logo not required)	
Other (Shop drawing submittal required)	

7.8 Meter Box and Lid (Select one)

Manufacturer	Check
Not used on project	
Carson Brand (Box)	
Old Castle/ East Jordan Iron Works (Lid)	
EBBA Iron (Lid)	
DFW (DFW39C-12-BODY and DFW1324C-12-BODY Boxes)	
Other (Shop drawing submittal required)	

7.9 Valve Box (Select one)

Manufacturer	Check
Not used on project	
Tyler Union	
Star Pipe Products	
US Foundry	
Other (Shop drawing submittal required)	

7.10 Wetwell and Valve Pit Structures
(Select one)

Manufacturer	Check
Not used on project	
Shop drawing submittal required for Tremie Seal method.	
Other (Shop drawing submittal required)	

Liners and Coatings

8.1 Coating for External Ductile Iron Pipe and Non-Wet Concrete Surfaces (Select one)

Manufacturer	Check
Not used on project	
Tnemec Perma-Glaze 435	
Other (Shop drawing submittal required)	

8.2 Manhole Chimney Seal (Select one)

Manufacturer	Check
Not used on project	
Wrapidseal	
Other (Shop drawing submittal required)	

8.3 Wetwell, Valve Pit, & Manhole Coatings
(Select one for each category)

Level I

Manufacturer	Check
Not used on project	
Carboline 300M	
Other (Product specifications required)	

Level II

Not used on project	
Sewper Coat	
BASF SP15	
Other (Product specifications required)	

Level III

Not used on project	
BASF Sewer Guard HBS 100 Epoxy Liner	
Other (Product specifications required)	

8.4 Wetwell, Valve Pit, & Manhole Liners (Select one)

Manufacturer	Check
Not used on project	
Shop drawing submittal required	

Pumps

9.1 Submersible Wastewater Pumps (3-100HP)
(Select one)

Manufacturer	Check
Not used on project	
Other (Shop drawing submittal required)	